AUGUST 9, 1951

# IRON AGE

VOL. 168 NO. 6

THE IRON AGE
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# DIGEST

## of the week in metalworking

**STEEL MARKET BALANCE IS STILL FAR AWAY**

PAGE 15

Normal balance between steel supply and demand is not predicted in the foreseeable future. Even a controlled balance through CMP can't be achieved before the first quarter of next year, industry believes. Few in industry have confidence in NPA's policing of regulations covering inventories.

**HAIL MACHINE TOOL SUPER PRIORITIES**

PAGE 29

While machine tool men studied the latest pricing move and awaited clarification on some points, they also hailed the granting of super priorities so that builders can get tools to make tools as a step in the right direction. Of course, it should have been taken a long time ago, most say.

**POLITICAL SPEECHES FOR EVERY AUDIENCE**

PAGE 54

For political reasons it may have been expedient to say that Detroit is "farming out" too much of its defense work. Union leaders have been hammering that point for some months. President Truman, attending the city's anniversary, repeated the charge and Mobilizer Wilson followed suit later.

**PACIFIC PRODUCTION HOLDS DESPITE CMP**

PAGE 59

On the whole, production of defense and civilian items seems to be holding its own in the Pacific Northwest despite the confusion and delays of CMP. It would be tough finding a metalworking plant in the area where output has been seriously curtailed. There have been some supply troubles.

**PROTEST STORM SETTLES ON OPS HEADS**

PAGE 61

Government price stabilizers are looking up at storm clouds of protest as a result of their refusal to grant without any dodges the pricing relief authorized by the new Defense Production Act. Trouble arises from the OPS interpretation of the so-called Capehart and Herlong amendments.

**AUTOMATIC HEAT TREAT FURNACE LOADING**

PAGE 63

An automatic loading machine for a single heat treat furnace is loading small parts at a uniform rate on a 24-hr basis. Fatigue has been eliminated and annual labor savings of $17,500 are estimated on a single installation. Use of the machine has increased furnace output by 10 pct.

**HIGH-VELOCITY BURNER SAVES FUEL, SPACE**

PAGE 68

Used with standard accessories, this ram-jet-principle burner reduces heating equipment volume as much as 75 pct. It completely vaporizes and burns liquid or gas fuel, producing soot-free stack gases, or heat and special atmospheres. Excess air is not needed to insure good combustion.

**SPECIAL CUTTER FOR DEEP TREPANNING**

PAGE 72

A study of special techniques and cutter designs for deep-hole trepanning shows this method is more economical and more reliable than boring or drilling holes in long workpieces. Large-diameter bores with excellent surface finish and less runout can be trepanned in a single pass.

**STEEL PROFITS LAG BEHIND PEAK OUTPUT**

PAGE 85

Steel industry earnings are lagging far behind the peak production records, rise in capacity, and sales. Steel leaders however aren't singing the blues. Their earnings in the second quarter of 1951 look very healthy as compared with any period except the peak second quarter of last year.

**TITANIUM — U. S. ASKS QUANTITY OUTPUT**

PAGE 86

Greater production of titanium for use on some jet engine applications instead of scarce alloy steels may stem fro msigning of letters of intent by Titanium Metals Corp. and DuPont. Output of the lighter-than-steel metal may reach 10 tons per day at enlarged facilities of the companies.

**STOCKPILING — NEW AIMS, NEW SETUP**

PAGE 89

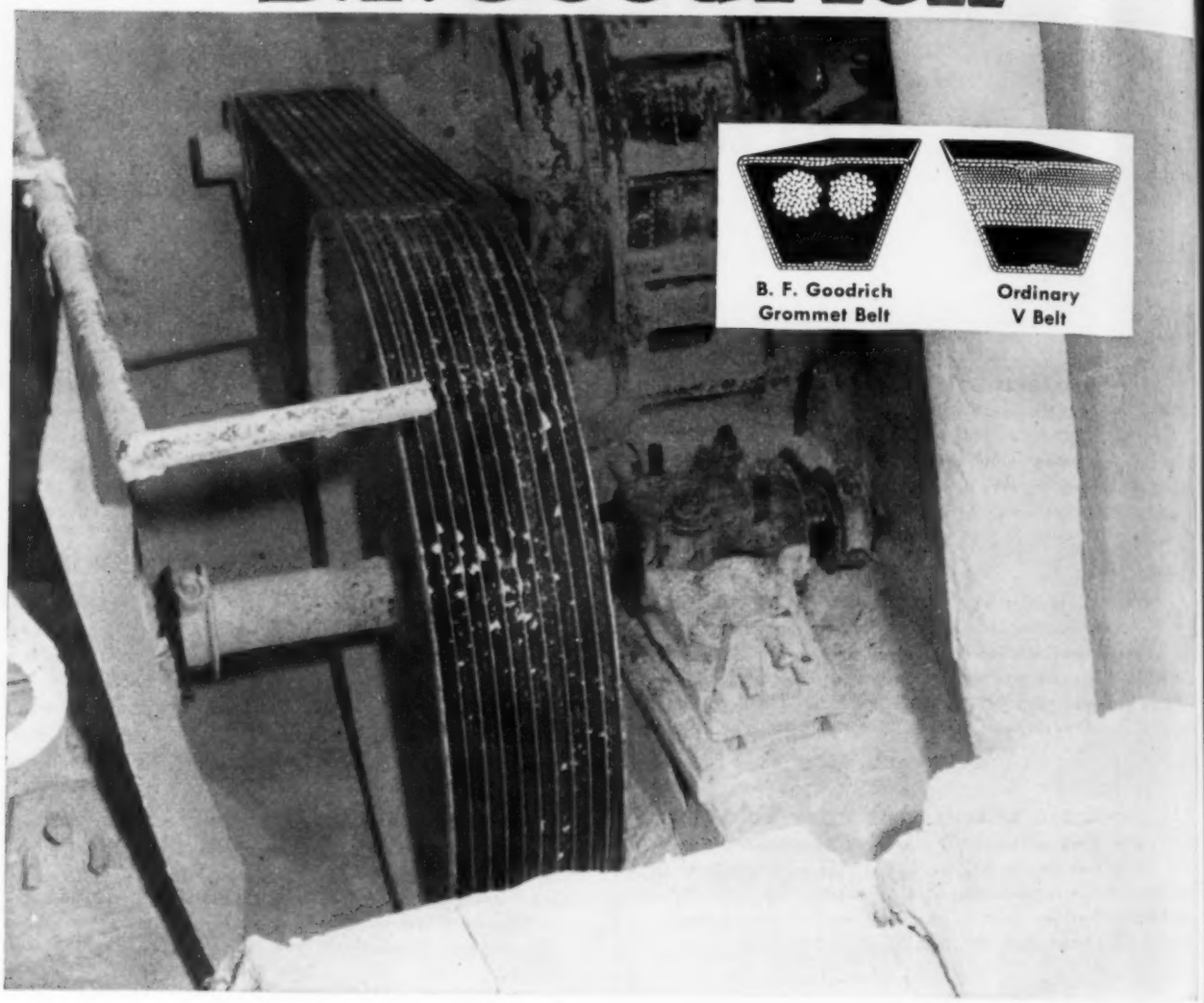
Jess Larson, former General Services Administrator, has been named as head of the new Defense Materials Procurement Agency. The new agency will consolidate a number of stockpiling functions previously performed by other agencies. It will continue the increased stockpiling program.

**HOW TO GET THE MOST FROM YOUR LATHES**

NEXT WEEK

Automatics and turret lathes are wonderful, but don't neglect the possibilities of engine lathes. There are many special attachments and accessories which can be used to increase their versatility and production. The first in a series of articles on lathe attachments and accessories.

RESEARCH KEEPS **B.F.Goodrich** FIRST IN RUBBER




# Where a change to B. F. Goodrich grommet belts saved $100 a week

*B. F. Goodrich grommet V belts cut costs 20 to 50%*

WHAT would you do if you were spending $100 a week to replace failing V belts on one drive? That was the case in this mill — ordinary V belts failed in a week or less. They couldn't carry the terrific power load.

The company called in the BFG sales engineer and B. F. Goodrich grommet V belts were installed. That was 5 months ago and the grommet belts look as good today as the day they were installed. Here's why:

*Endless* — A grommet is endless, made by winding heavy cord on itself to form an endless loop. It has no overlapping cord sections. Because most of the failures in ordinary V belts occur in the region where cords overlap, the endless grommet belt eliminates such failures.

*Concentrated cord strength* — All of the cord material in a B. F. Goodrich grommet belt is *concentrated* in twin grommets, positioned close to the driving faces of the pulley. No layers of cords to rub against one another and generate heat; cord and adhesion failures are reduced.

*Better grip, less slip* — Because a grommet is endless, a grommet belt is more flexible, grips the pulleys better. Size for size, grommet belts will give ⅓ more gripping power, pull heavier loads with a higher safety factor.

*Only B. F. Goodrich has the grommet!* — No other multiple-V belt is a grommet belt (U. S. Patent No. 2,233,294). Now available in C, D and E sections. See your local B. F. Goodrich distributor. Ask him to show you his "X-ray" belt that illustrates grommet construction clearly. *The B. F. Goodrich Company, Industrial and General Products Division, Akron, Ohio.*

*Grommet Belts* BY

**B.F.Goodrich**

**RUBBER FOR INDUSTRY**

IRON AGE

# editorial

## *Age Of Opportunity*

WE hear that some people are turning down bigger jobs. Seems they like the pensions, the insurance, the sick leave and the knowledge that they won't have to make new decisions. At least that is the undercover news these days in the gossip market.

These turndowns or failures to move up the ladder are not to be confused with the jobs that are held because the people actually like them. There are too many people who don't like their jobs to get the two cases confused.

Then we hear on the same wavelength that opportunity is dead. There are no chances like there used to be. Some people say that working for a big company is like being a cog with no personality or individualism.

Of course we hear the same kind of a gripe from people who are with smaller companies. There the tune is slightly different. It is either that the white-haired boy has the password or that the boss' relatives have all the plums.

Along with this negative thinking is the new way of looking at things—"What's in it for me?" A lot of workers these days—at key point levels—actually analyze and make decisions entirely on the basis of what it means to them—first, last and always.

There must be some reason for this. Maybe it is because most of the fledglings coming up have been under some kind of controls since 1940—except for a few short years. We had wage, price and production controls. We have them again. This has bred an insidious idea that we need someone else to solve our troubles. It is not only the fledglings and the key men who have been sold this bill of goods. Plenty of the old heads who once had no fear and plenty of imagination think that this and that will happen if we don't control the whole shebang.

It is time we either threw in the sponge or realized that there is still opportunity for anyone who wants to do a little more than a good day's work. It is still not too late to see daring, imagination and chance-taking rewarded with either success or bitter experience.

It will be too late if too many of us are overcome with the paralyzing effect of "What's in it for me?"

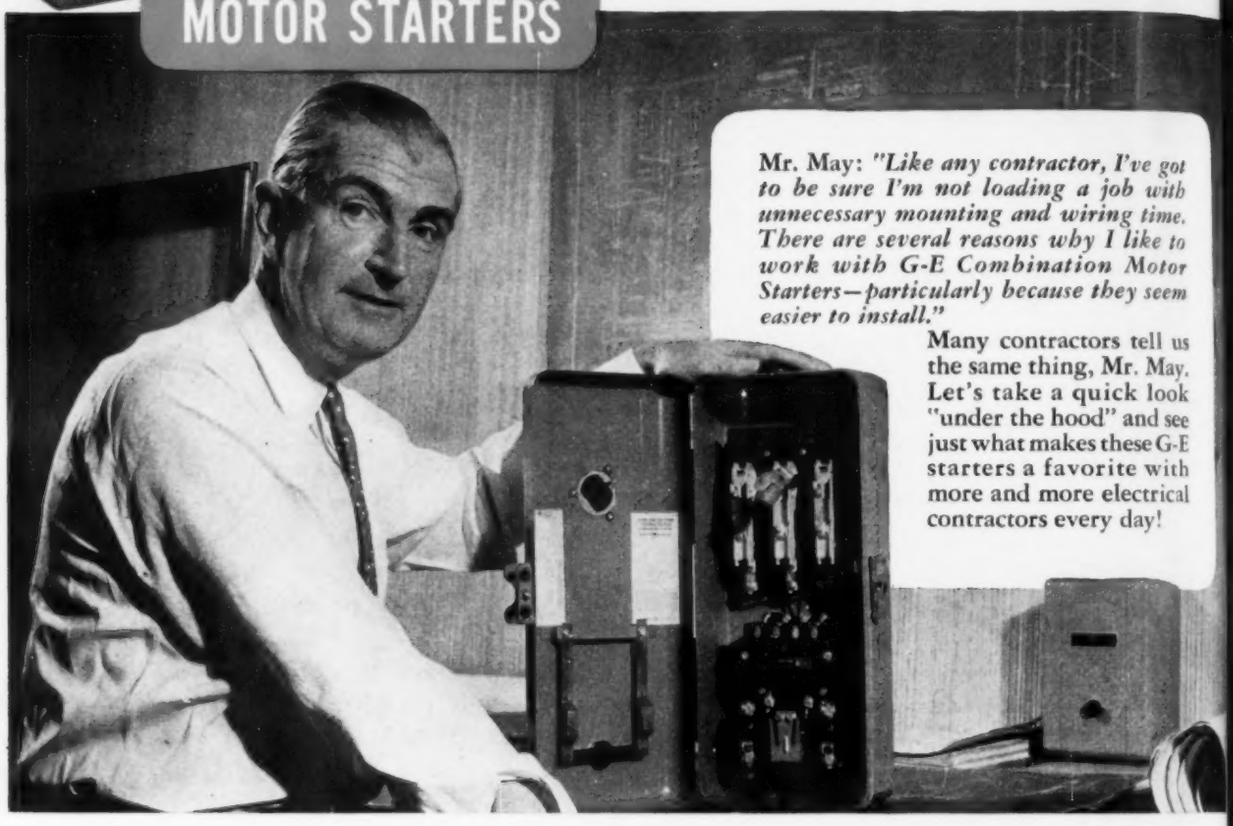
Tom Campbell

*Editor*

COMBINATION
MOTOR STARTERS

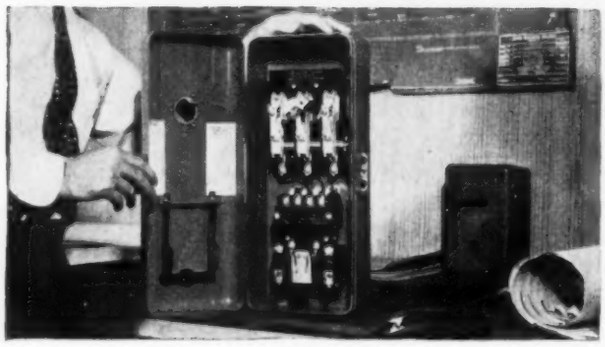
# ....save wiring

**E. G. MAY, ELECTRICAL CONTRACTOR**

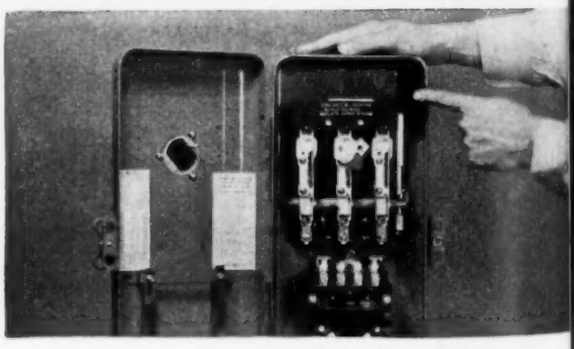


Mr. May: *"Like any contractor, I've got to be sure I'm not loading a job with unnecessary mounting and wiring time. There are several reasons why I like to work with G-E Combination Motor Starters—particularly because they seem easier to install."*

Many contractors tell us the same thing, Mr. May. Let's take a quick look "under the hood" and see just what makes these G-E starters a favorite with more and more electrical contractors every day!



1 Mr. May: *"Suppose we start with the mounting. There's a real time-saver!"*
That's right, Mr. May. Both starter and disconnect switch are mounted in one case. Thus, they're installed as a unit! You save wiring time and your customer gets a neater installation!



2 Mr. May: *"Wiring room is mighty important to contractor."*
Then you should like the layout of this starter. There's plenty of room at top and bottom for line and load wiring. Of course, we take care of wiring the disconnect switch to the starter at the factory.

**GENERAL ELECTRIC**

730-24

# IRON AGE *newsfront*

*news methods and product forecast*

► Research studies on cooling in machining indicate that a lot of practical immediate benefit is likely to come from more emphasis on cooling the coolant rather than on further study of other metal cooling techniques. However, work on the latter may yield important machinability gains on many special applications.

► Blast furnace expansion looms large in the steel industry's plans to solve its problems of metallics supply. Industry expansion plans include about 6 million tons a year more pig iron than have so far been announced.

► By infiltrating iron powder with a copper alloy a New England company has produced a powder part which replaces a high-carbon, high chromium alloy steel casting in a household waste disposer.

► The United Auto Workers (CIO) is using the same educational program to train union personnel in its upstate N. Y. school as is used by some 50 industrial firms. The program, developed jointly by Inland Steel and Borg-Warner aims at stimulating thought instead of trying to cram ready-made ideas down workers' throats.

Only restrictions on use of the program is that it can't be used for political purposes and admission can't be charged.

► Navy studies indicate that cathodic protection of tanks, pipes and power cables increases their useful life by 5 to 10 years. Already used in industry, the Navy has four corrosion engineering firms working on the process, which involves flowing dc current toward the metal to be protected.

► Steelmaking scrap stocks are growing larger partly due to the scrap drive, mainly for seasonal reasons. But this is no cause for optimism because: (1) They are still below normal; and (2) winter reserves are not building up.

► Now that Manly Fleischmann heads Defense Production as well as National Production Authority, one of his first jobs will be to make certain that figures used by the two agencies jibe.

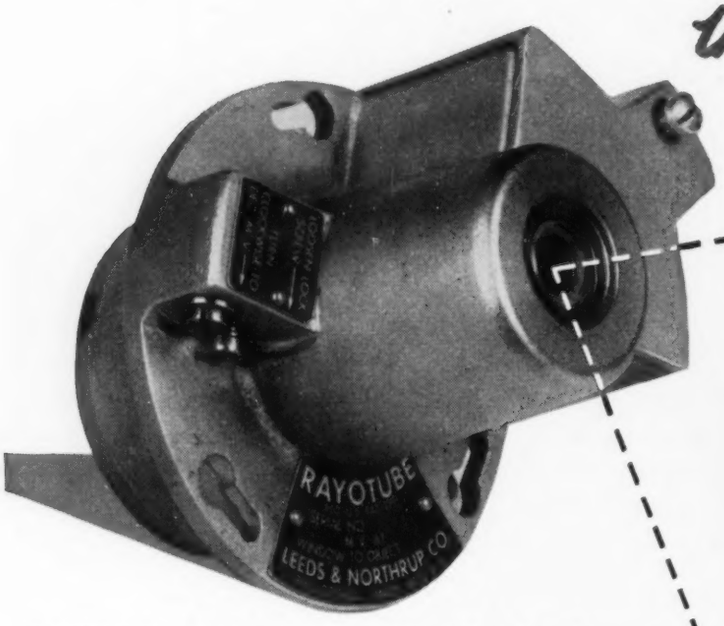
► Jet fighters are being equipped with a flexible exhaust tailpipe —an alloy steel bellows. It's designed to avoid the complications caused by deflection (as much as 3 in.) of the tail surfaces when planes level out from power dives.

► Metallurgists are getting scarcer because their importance in manufacturing plants is rising by leaps and bounds. Reason: percentage of alloying elements in steel is constantly shifting and use of boron steels is zooming.

► Scattered reports indicate existence of a band of organized scrap-conscious thieves in northwestern Ohio. There farmers report blowtorches have been used on good machinery to cut it apart and haul it away from fields at night. Details on whether or not the torches cut to charging box size are not available.

► The Bureau of Standards has developed an experimental crystal clutch in its search for fast-acting clutches for high-speed computers. Three Bimorph flexible crystal plates bend when opposite potentials are applied to different parts of their surfaces, "connecting" an output disk to the input disk through a pressure plate.

# Can this new Rayotube mean better control of temperature in your plant?



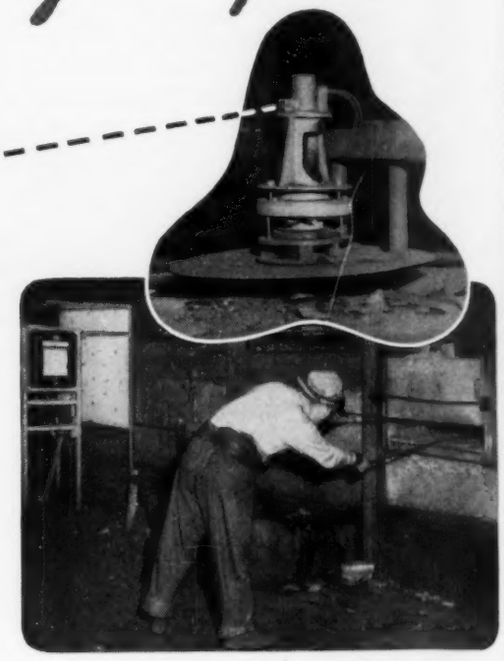

BUILT to detect temperatures for either Speedomax or Micromax Controllers, this new Rayotube No. 8890 has three features which help to improve the accuracy of control action.

1. The water jacket often needed for earlier Rayotubes is seldom required for this one because accuracy is not affected by ambient temperatures unless the head housing itself (shown above) exceeds 350 F. Omitting the jacket greatly simplifies installation and saves both water and maintenance due to water lines.

2. Overheating the Rayotube head to as high as 500 F does no harm; the accuracy decreases above 350, but returns fully as temperature drops. Thus, a few minutes' glare from an open furnace door does not affect the instrument's usefulness.

3. New, quick-sighting optical system for aiming the Rayotube at area of important temperature is especially helpful when aiming down an open-end tube to measure directly the surface temperature of parts being heated.

Catalog N-33B describes all Rayotubes as well as Speedomax and Micromax Pyrometers; we also can send description of this Rayotube only. Kindly address either our nearest office, or 4956 Stenton Avenue, Philadelphia 44, Pa.



In Henry Disston & Sons, Inc. plant, Rayotube in slab furnace roof needs no water-jacket against high ambient heat.

In spite of high ambient temperature, this Rayotube in roof of an open-hearth furnace has neither water-jacket nor air connection.

Jrl Ad NS3(2)

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LEEDS & NORTHRUP CO.

# IRON AGE *summary*

*iron and steel industry trends*

**Even "artificial" balance of supply and demand escapes NPA . . . Free market forces expected to help make controls work . . . Fear for conversion.**

**Not a Chance**—There is no chance that steel supply and demand will be brought into balance this year. Even the "artificial" balance which the National Production Authority is seeking to bring about with its Controlled Materials Plan is not possible to attain before the first quarter of 1952. It will take that long to unsnarl the present confusion and get CMP operating on a realistic basis.

**Paradox**—But so far there is no guarantee that CMP will be operating realistically—that steel tickets will match production—by the first quarter, or later. It is quite a paradox that NPA is counting heavily on natural, free-market forces to make its controls over steel distribution work effectively. It is assuming that many customers will not order as much steel as they are allotted. And it is assuming that many others will cancel steel tonnage when they find their inventories growing too large.

This thinking is not as weird as it sounds. This is the way the free steel market normally corrects itself. Purchasing agents lengthen their buying lead time and scramble for supplies when they are scarce. When supplies become more plentiful, or inventories grow, the PA's reduce their buying by shaving lead time or cancelling orders. This is the way supply and demand function in their most free and simple form.

**First Signs**—Actually, the first glimmering of inventory correction is already showing up in the steel market. Several orders have been cancelled by consumers seeking to adjust their inventories. In another case a steel mill has been told by one of its customers that he is embarrassed by the inventory he has accumulated.

**But No Trend**—This is not yet an established trend. The cancellations are not numerous and they do not involve large tonnages. They are still the exception, rather than the rule. When they do grow to significant proportions steel people will be on the alert for a changing market. Then they'll have a hard time telling how much results from natural market forces and how much from too-large allotments.

**Police Job**—Industry has little faith that inventory regulations can or will be effectively policed, even though NPA has warned that violations will be prosecuted. Some steel sources have sounded a stern warning of their own. They feel that too-liberal granting of allotments under CMP is an invitation to participate in the gray market.

**(Nonferrous summary, p. 118)**

**Conversion Fears**—Auto firms are still up in the air over their future. They are afraid inclusion under CMP will leave them completely out in the cold for steel supplies. Unless they receive special help, there is little chance they could book much tonnage under CMP before next year.

They are also worried about their conversion arrangements. These still constitute a large share (possibly 20 pct) of their steel. The independents, as well as the Big Three, are still buying ingots and expect to continue doing so. Since many conversion ingots are eventually processed into bar steel, their importance to auto producers is magnified.

**Behind Bars** — Right now all carbon bars under half an inch are desperately tight. Inventories of the small sizes are probably the lowest in the entire postwar period. It is feared that this shortage will make government cutback orders on autos academic. But auto people are going right ahead with conversion arrangements, despite the outlook for less auto production. They have to if they expect to keep going even on three cylinders.

Steelmaking operations this week are scheduled at 101.5 pct of rated capacity, unchanged from last week's revised rate.

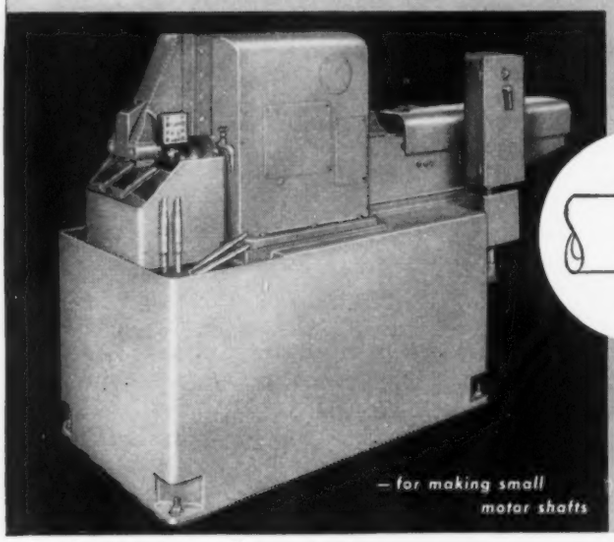
# MOTCH & MERRYWEATHER

# Cam Automatics-

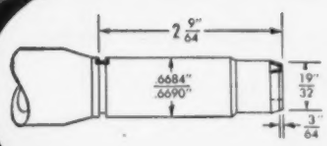
**HOPPER LOADING OR BAR FEED**

**• COMPLETELY AUTOMATIC •**

**TWO SPINDLES CONTROLLED BY ONE MAIN CAMSHAFT!**

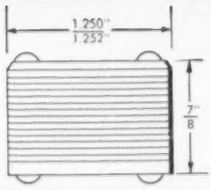


— for making small motor shafts



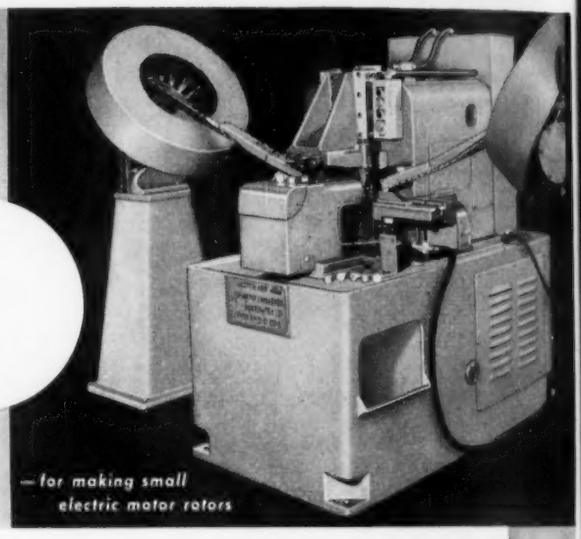

**MOTOR SHAFTS**

*Operation:* Turn, neck and chamfer.
*Material:* Steel tubing.
*Production:* 1400 pcs/hr. @ 100% efficiency.

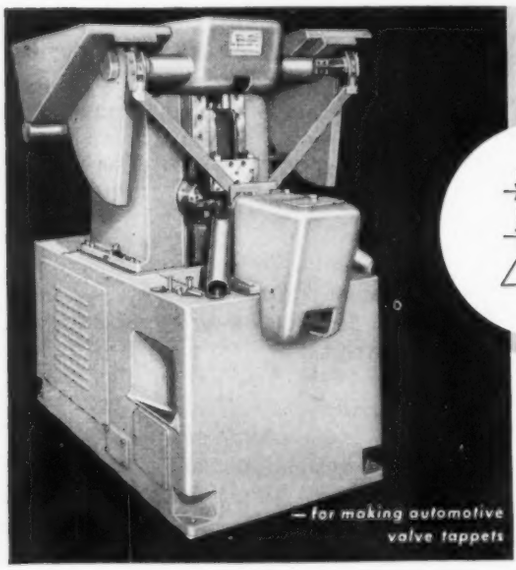



**SMALL MOTOR ROTORS**

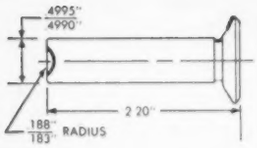
*Operation:* Turn O. D. and chamfer one end.
*Material:* Laminated silicon steel.
*Production:* 800 pcs/hr. @ 100% eff.



— for making small electric motor rotors



— for making automotive valve tappets




**VALVE TAPPETS**

*Operation:* Radius, neck and chamfer.
*Material:* 5120 steel.
*Production:* 2400 pcs/hr. @ 100% efficiency.

Stock feed, loading and locating mechanisms, collets and feeds of tool slides are controlled mechanically by a single camshaft — *simplicity itself.* M. & M. cam automatics require minimum attention and only occasional checking of work-pieces. If you will submit your drawings and specifications, we will tell you how Motch & Merryweather cam automatics can increase your *production with accuracy.*

*Manufactured by*

**THE MOTCH & MERRYWEATHER MACHINERY COMPANY**

**715 PENTON BUILDING • CLEVELAND 13, OHIO**

***Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines***

**PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT**

*Simply* clean surface

STEP 1

*Simply* apply dy✓chek Dye Penetrant *(by brush, spray, or dip)*

STEP 2

## Simplified Non-Destructive Testing

*Simply* remove excess dye with dy✓chek Dye Remover

STEP 3

*Simply* apply dy✓chek Developer

STEP 4

# New Way to INSPECT METALS

*Save dollars... save time... and be sure!*

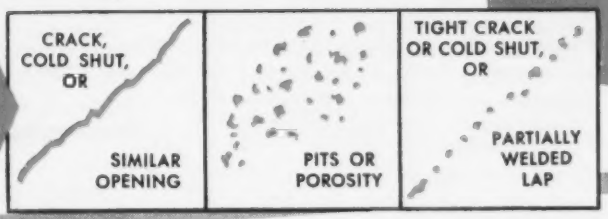
HERE ARE FACTS ON

dy✓chek TRADE-MARK

*the dye penetrant inspection method*

PATENT PENDING

**AND... FLAWS ARE REVEALED**




## ANSWERS TO YOUR QUESTIONS

**Q.** What is Dy-Chek?

**A.** Dy-Chek is the revolutionary new dye penetrant method of inspection offered *exclusively* by Turco Products, Inc.

**Q.** What does it do?

**A.** Dy-Chek reveals the location, extent and nature of any flaw having a surface opening or discontinuity . . . and in any metal.

**Q.** What kinds of metal surfaces?

**A.** Magnetic, non - magnetic, castings, forgings, machined parts, plate, sheet tubing, pipe and weldments.

**Q.** What about special equipment?

**A.** No special lights, booths, current supply or installations. Dy-Chek consists of three special liquid compounds easily applied by brush, spray or dip methods.

**Q.** What about expense?

**A.** No investment, royalties, etc. Liquids are moderately priced. Dy-Chek materials cover large areas per gallon.

**Q.** How about preventative maintenance in the field as well as plant use for manufacturing and receiving inspection?

**A.** The complete portability of Dy-Chek is one of its greatest advantages.

**Q.** Where can I use Dy-Chek?

**A.** In use in practically every metal process. In case of specialized procedures, describe the nature of your problem.

**SAVE TIME AND MONEY** Dy-Check is a dollar-and-sense approach to receiving, intermediary and product inspections. Write today on your company letterhead describing your application.

**WRITE TO TURCO-**

LICENSED MANUFACTURER AND DISTRIBUTOR

dy✓chek

TURCO PRODUCTS, INC.

6135 SOUTH CENTRAL AVENUE, LOS ANGELES 1, CALIFORNIA

A DEVELOPMENT OF NORTHROP AIRCRAFT RESEARCH

A greater variety of fasteners and small parts that can be made faster, stronger and more economically by Pheoll's cold heading and roll threading methods. Cold working of wire stock often surpasses turning, casting, stamping, drawing or molding.

**LOWER MATERIAL COST** . . . Cold-heading results in much less scrap than in metal cutting operations, in fact in the production of most cold-headed parts there is little or no scrap.

**LOWER PRODUCTION COST** . . . due to high production rate. Cold-heading . . . entirely automatic, is not affected by operator skill, strength or fatigue.

**LOWER DIE COST** . . . Cold-heading dies cost less, even on more intricate sections, than for *any other forming operations*.

**INCREASED TENSILE STRENGTH** . . . Improved physical properties are imparted to all metallic fasteners by cold working.

**GREATER TOUGHNESS and FATIGUE RESISTANCE** . . . because grain flow of material is compacted and directed to follow contour of piece.

**UNIFORMLY HIGH QUALITY PARTS** . . . assured because cold working requires materials free from structural defects.

Single or multiple secondary operations can be performed on cold headed parts to produce special characteristics required to fit the part for its particular application. Such operations include drilling, tapping, milling, shaving, flattening, notching, flanging, trimming, bending, off-setting, slotting, fluting swaging, knurling, pointing, heat treating, plating and finishing—all in Pheoll's modern plant.

**PHEOLL PROFIT PRODUCING FASTENERS**

| | |
|---|---|
| Machine Screws | Thread Cutting Screws |
| Phillips Recessed Head Screws | Tapping Screws |
| Sems | Cap Screws |
| | Threaded Rods |

Pheoll MANUFACTURING COMPANY
5700 ROOSEVELT ROAD
CHICAGO 50, ILLINOIS
SCREWS • BOLTS • NUTS
*Industrial Fasteners and Holding Devices*


# *Dear* EDITOR

*letters from readers*

## Appreciation

Sir:

You will be interested to know that the Dy-Chek Co. has been sold by Northrop Aircraft, Inc., recently. But before new hands take over, I want to express to you my personal and very real appreciation for the part your publication has played in making Dy-Chek an outstanding success in a few short months.

Four months after the first publicity was released and 3 months after the original announcement ad appeared, an authoritative, independent survey disclosed 23 pct penetration of United States metalworking plants with 1000 or more employees—almost unbelievable inroads were made against strongly-entrenched direct competition.

Largely due to your kind of interest and enthusiasm, Dy-Chek recognition has mounted steadily. As an advertising man turned sales manager, I am more than ever impressed by the job business papers are doing.

*J. A. GREER*

*Dy-Chek Co.*
*Division of Northrop Aircraft, Inc.*
*Hawthorne, Calif.*

## Housekeeping

Sir:

We would very much appreciate your permission to use a condensation of the article "How Good A Housekeeper Are You?" by W. G. Patton which appeared in your July 12 issue.

*M. FRIEDLANDER*
*Editor*

*The Foreman's Digest*
*Englewood, N. J.*

## New Air Heater

Sir:

Would you please give us the name and address of the company who has built the new type of air heater mentioned on the Newsfront page of your June 21 issue.

*R. V. VOLTERRA*

*General Plate Div.*
*Metals & Controls Corp.*
*Attleboro, Mass.*

This new type of air heater was made by Thermal Research & Engineering Corp., Conshohocken, Pa. There was a typographical error in that item and the statement of 1700 lb of air per second should have read 1700 lb of air per minute.—Ed.

## Help Wanted

Sir:

Our book agents report that the following numbers of THE IRON AGE which are missing from our files are out of print and unobtainable: Mar. 27, 1943 and Nov. 7, 1946.

Since this may leave our reference files permanently incomplete can you help us get copies of these numbers, either new or second-hand.

*R. F. KENNEDY*
*City Librarian*

*Public Library*
*Johannesburg, South Africa*

We'll forward copies if any reader can supply them.—Ed.

## Magnetic Inspection

Sir:

On the Newsfront page of your June 28 issue an item appeared on a new magnetic particle method for finding small cracks in porcelain enamel.

We would appreciate further information on this subject.

*H. MORTENSEN*
*Lab Manager*

*Deepfreeze Div.*
*Motor Products Corp.*
*North Chicago, Ill.*

More information can be secured from the Magnaflux Corp., 5908 Northwest Highway, Chicago 31, Ill.—Ed.

## Machining Method

Sir:

In the June 15 issue of "Technische Rundschau", published in Bern, Switzerland, on p. 19 there appeared an article about the new Cavitron method which seems to be revolutionary in machining (boring and thread cutting) of completely sintered carbides and hard metals.

We would appreciate your advising us where we can obtain additional technical information on this method.

*M. GLENN*
*President*

*Unex Products Corp.*
*New York*

More information on the Cavitron method can be obtained from W. D. Burrows, Cavitron Corp., 155 E. 44th St., New York. In our July 26 issue there appeared an article "Electro-Mechanical Method X Machines Carbides, Hard Alloys" which is a similar type of machining method as that used by Cavitron.—Ed.

## Trademark

Sir:

Your attention is respectfully called to the fact that the word "Multi-Slide" is our registered trademark. The word, which appeared on p. 70 of your June 28 issue, should therefore never be used without quotation marks or suitable indicating means to show that it is a registered trademark.

*W. P. POWERS*
*Secretary*

*Associated Patentees, Inc.*
*Ampere, N. J.*

Sorry, we were unaware that 'Multi-Slide' is a registered trademark of your company.—Ed.

# per machine, per hour . . . when you do the job with MX

## *today's freer-cutting screw stock!*

UP in Canada, too, manufacturers of screw machine parts know a good thing when they see it. Look over these figures on increased production that one of the biggest parts producers across the border has obtained by switching from ordinary Bessemer screw stock to MX.

Here again, as in shops in this country where U·S·S Free-Machining MX has been put to work, output per man, per machine, per hour has increased. In addition, costs have dropped and part finish has been improved.

While production increases of 29%, 33⅓% and 50% like those shown here are important, equally important is the fact that MX, because of its greater uniformity and better machinability, will permit you to turn out quickly and to close tolerances the more intricate and precise products you are being asked to produce.

What's more, MX will cut the cost of *any* part you now machine from ordinary Bessemer screw stock, even though MX costs a little more. We base this claim on the amazing results obtained with MX to date, in producing over a billion parts of many different kinds.

U·S·S Free-Machining MX more than pays for itself by (1) increasing the rate of production which *lowers the cost per part.* By (2) prolonging tool life which *reduces machine down-time.* By (3) assuring better part finish which often *eliminates extra finishing operations.* By (4) providing closer dimensional accuracy which *minimizes rejections.*

You owe it to yourself—and to your customers—to give MX a trial.

U·S·S Free-Machining MX is being produced in all the popular screw stock sections and sizes. You can obtain it in cold-finished form from your regular supplier as "MX," or under his own identifying trade name. In hot-rolled form, MX is available direct through our nearest district sales office.

***Now, when production is more important than ever—speed up the job with MX***

**IRON AND STEEL SCRAP is a VITAL DEFENSE MATERIAL**

**LET'S GET IT TO THE MILLS**

**IT MEANS MONEY FOR YOU MORE STEEL FOR AMERICA**

USS

AMERICAN STEEL & WIRE COMPANY, CLEVELAND • COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM • UNITED STATES STEEL COMPANY, PITTSBURGH
UNITED STATES STEEL SUPPLY COMPANY, WAREHOUSE DISTRIBUTORS, COAST-TO-COAST
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

1-1162

UNITED STATES STEEL

insist on
"buried" integrity
in your products

In the durable goods field most of the products are composed of many component parts. Acadia Synthetic Rubbers are contributing importantly to the superiority of thousands upon thousands of these products on land, sea, and in the air—from battleships to tiny instruments. For years manufacturers in hundreds of industries have found by experience that, with Acadia Synthetic Rubber parts in their products, they will never have trouble from that source. Acadia is a "buried" but vital component for products of highest integrity. Insist upon it!

for every synthetic rubber requirement

sheets • tubing • strips • channel • washers
seals • bellows • gaskets • rings
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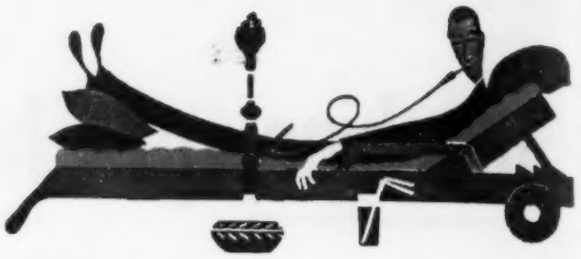
ACADIA Synthetic PRODUCTS

Processors of Synthetic Rubber and Plastics
Sheets • Extrusions • Molded Parts

DIVISION WESTERN FELT WORKS
CHICAGO 23, ILLINOIS



# Fatigue Cracks

*by Charles T. Post*

## Our Fighting Men

A letter from the front lines of the Pentagon informs us that "the office addressed as: Industrial Publications Section, Publications Branch, News Division, Bureau of Public Relations, War Department, is now Industrial Relations Branch, Public Information Division, Office of the Chief of Information, Department of the Army."

The name is changed, all right, but it's still the same old Army.

## Overtime

The union steward at one of the big Western machine tool builders was engaged in a heavy hassle with management about overtime pay. About 4:55 p. m. there was a lull in the meeting, and one of the shop workers barged in to talk to the steward.

"Can't talk to you now, said the steward, brushing him off.

"Well, when will you be out?"

"You know I quit at five, so just wait outside the door."

The steward wouldn't be caught working overtime discussing overtime with the management. A man has to be careful.

## Cruising Down the River

Usually you have to be chairman of the board to have a boat named after you, but here you can see, with your own eyes, the majestic river ship "Iron Age." Built in 1880, she used to tow iron and steel between Pittsburgh and St. Louis. True to her name, she showed the way to the other boats, for she was one of the first to have an electric headlight. We gleaned this from *The Work Boat*, which published a full account in its June issue, and was kind enough to loan us the picture. Incidentally, *The Work Boat* is located in New Orleans' Peace Building and Barney Breedlove is managing editor. Sort of an aptronym, what?

## Puzzlers

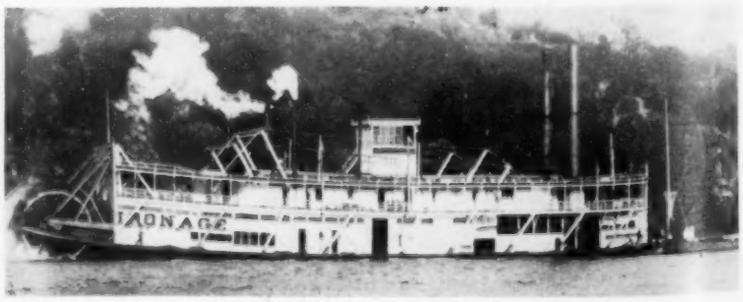
The answer to last week's number puzzle should look like this:

$$50 + 49 + \frac{1}{2} + \frac{38}{76} = 100$$

The radius of curvature of the curved portion of the track in the race track problem should be 479.15 ft according to C. E. Norton, Chicago, C. E. Blass, Talon, Inc., I. Ropp, Ropp & Blackstone, L. F. Calzi, Philadelphia and R. W. Huff, Canton, Ohio.

C. S. Kinnison, Hoskins Mfg. Co. and M. J. Garrett, Highland Machine Co. have the ages of the Ludwig family and C. E. Blass agrees with our answer to the triangle problem.

During the hot spell we went to the store to get a bottle for our liquid refreshment and were told that the bottle and cap cost $1.05 but if purchased separately the bottle was $1.00 more than the cork. How much did we have to pay for the bottle alone?



# machine tool high spots

*sales inquiries and production*

*by George Elwers*

**More Details Needed**—Industry reaction to the latest price move was slow in coming. It is building up out of the initial confusion and awaits study of the new regulation and clarification of some points—particularly in the cutoff date for costs which may be included in the new ceilings.

If costs to July 26 can be included, realistic prices may be possible. The granting of a super priority to get tools to make tools is hailed as a step which should have come a long time ago. Now builders can make first claim on the output of their industry for their own expansion. (See p. 92 for full story.)

**Not Too Hopeful**—Machine tool builders have been putting the exclamation point to shortages of skilled workers. And they have put their case before Washington. Now they are skeptically awaiting action on Defense Mobilizer Wilson's manpower directive.

They don't expect a landslide of help to solve all their problems and they are frankly pessimistic about any kind of assistance. They can review the experience of their cousins in the tool and die industry who have been promised help but get nothing but committee hearings.

**Project Priority**—Further reports on projected plans for scheduling delivery of machine tools indicate that not only will relative priority be established between the various defense projects now all clamoring on an equal basis for their equipment, but priority among machines for a given project may be introduced.

For example, only enough machines might be scheduled to establish pilot production at a given plant, at first. This would give the project a chance to work out production bugs and train personnel. At a later date, more equipment for expansion of production would be delivered.

**Logic Ignored**—This logical procedure has in theory been accepted but is not being practiced.

Because of the tool shortage and because there is no authority to prevent them from doing so, most defense plants are pressing for delivery of all the machines they have on order with little regard to when they actually will be needed. Delivery dates are specified, in most cases, as early as the builder will accept them, again with little regard for actual date of need.

**Production Ahead**—The Rockford, Ill., Ordnance plant will go into production this month under a contract signed by the Chicago Ordnance District with the W. F. & John Barnes Co., Rockford. The contract calls for production of several hundred thousand 155 mm projectiles on a cost-plus basis. Production will hit full stride next February, and the contract is expected to be completed in early 1953.

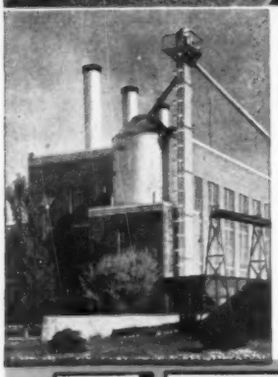
Previously, the Chicago Ordnance District had awarded the Barnes company a contract to equip a new unit of the Rockford plant for production of 105 mm shells by cold extrusion.

**Monarch Earnings**—Net earnings of the Monarch Machine Tool Co. for the second quarter of 1951 amounted to $195,709, or 47¢ a common share. Earnings for the first quarter were $155,400. The total net earnings per share of 84¢ for the first half of 1951 compares with 51¢ earned in the same period of 1950.

Though the firm went on a 24-hr, 6-day-week, operating basis last Jan. 1, the accelerated output of machine tools has not yet caught up with the increasing volume of business, according to Jerome A. Raterman, Monarch's president. The company's backlog, he said, has climbed above $25 million and continues to grow.

**Sorry**—In the final paragraph on this page last week, the National Machine Tool Builders' Assn. index figures quoted for June 1950 and June 1949 were incorrectly referred to as shipment index figures. The figures given actually represented the index of new orders for these months. The shipment index in June, 1950, stood at 78.6, and was 75.5 in June, 1949.

# MOVING SOMETHING* from HERE



**The other day someone asked us what Jeffrey did. Quick as a flash we said: "If you have something to move from here to there, we can do it." Yes, and all sorts of devices with which to do it. Besides, we can process it (cool, dry, screen, feed, pack and elevate it) . . . reduce it, if necessary, to desired fineness so that something else may be done with it.**

**Material handling, processing and reducing . . . that's our business. That's where we can be of real service to you. Jeffrey builds many types of conveyors —some that cannot be found elsewhere—bucket elevators, feeders, packers, dryers, coolers, screens, bin valves, chains of all kinds, crushers and pulverizers, car pullers, transmission machinery, etc.**

**Our engineers know a great deal about modern material handling methods and reduction machinery . . . know how to fit them into your plant layout to provide fast, straight-line production . . . more profit for you. Convey your problem to them and let them give you a lift.**

**SOMETHING takes in a lot of territory. But Jeffrey has a diversified line just as there are many kinds of material. Whether it's loose bulk or packaged, we can speed it on its way—at minimum cost and to your complete satisfaction.*

## to HERE

## THE JEFFREY MANUFACTURING COMPANY

ESTABLISHED 1877

925 North Fourth St., Columbus 16, Ohio

Complete Line of Material Handling, Processing and Mining Equipment

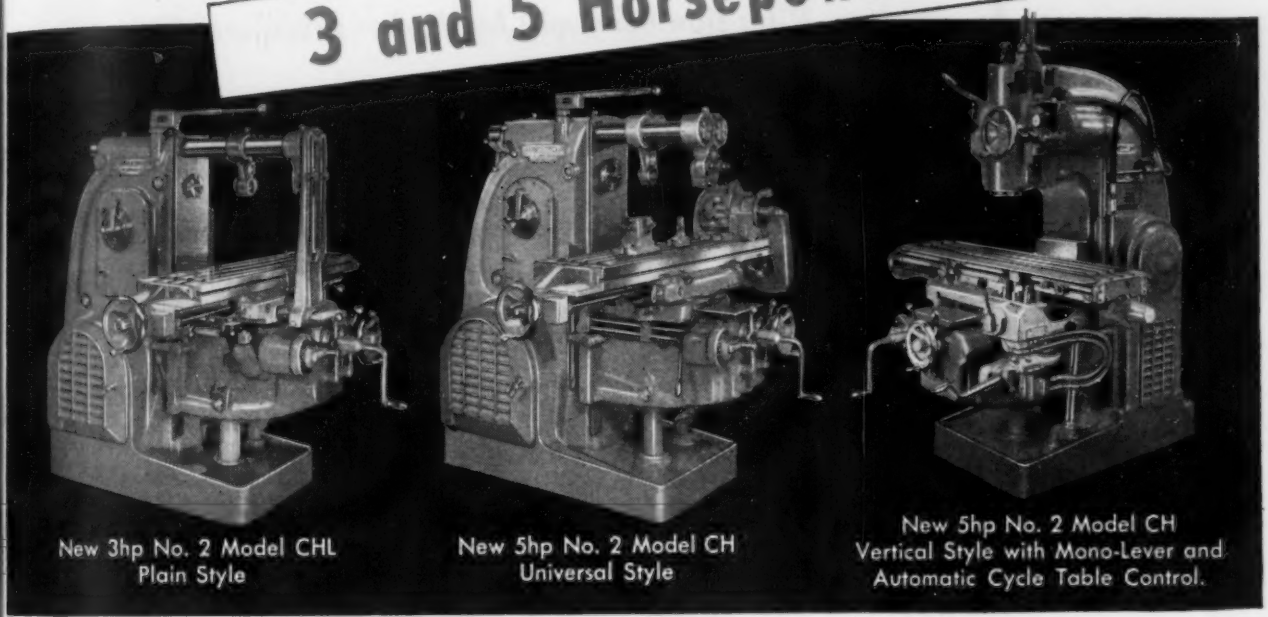
Baltimore 2 · Beckley, W. Va. · Birmingham 3 · Boston 16 · Buffalo 2 · Chicago 1 · Cincinnati 2 · Cleveland 15 · Denver 2 · Detroit 13 · Harlan, Ky. · Houston 2 · Jacksonville 2 · Milwaukee 2 · New York 7 · Philadelphia 3 · Pittsburgh 22 · St. Louis 1 · Salt Lake City 1 · Scranton 3

Jeffrey Mfg. Co. Ltd., Montreal, Canada
Jeffrey-Galion (Pty.) Ltd., Johannesburg, S.A.
The Ohio Malleable Iron Co., Columbus, Ohio
British Jeffrey-Diamond Ltd., Wakefield, England
The Galion Iron Works & Mfg. Co., Galion, Ohio
The Kilbourne & Jacobs Mfg. Co., Columbus, Ohio

# Kearney & Trecker Announces . . .

# THREE NEW KNEE-TYPE MACHINES

## 3 and 5 Horsepower



New 3hp No. 2 Model CHL Plain Style

New 5hp No. 2 Model CH Universal Style

New 5hp No. 2 Model CH Vertical Style with Mono-Lever and Automatic Cycle Table Control.

**New Kearney & Trecker No. 1 CH, No. 2 CHL and No. 2 CH Milling Machines (Plain, Universal, and Vertical Styles) have every performance-proven operating and construction feature needed for modern short-run or production milling requirements**

These specifications point up the new larger working ranges of these new machines. You'll find they provide you with new major cost-cutting possibilities for tool-room and production work. Feeds and speeds listed are standard ranges. Optional ranges available.

| Machine | TABLE | | | | | SPINDLE | |
|---|---|---|---|---|---|---|---|
| | Working Surface | Power Feed Travel | | Feeds Number & Range | Power Rapid Traverse — " Per Min. | Nat'l Std. Taper | Speeds — Number and Range |
| | | Plain & Universal | Vertical | | | | |
| No. 1 Model CH Plain, Universal and (swivel head) Vertical | 40" x 10½" | Long. 22" | 22" | 16—½" to 32" | 150" | 40 | 16 — 25 to 1500 RPM |
| | | Cross 8" | 10" | | | | |
| | | Vert. 17" | 16" | 16—¼" to 16" | 75" | | |
| No. 2 Model CHL Plain, Universal and (swivel head) Vertical | 46" x 10½" | Long. 28" | 28" | 16—½" to 32" | 150" | 40 | 16 — 25 to 1500 RPM |
| | | Cross 10" | 10" | | | | |
| | | Vert. 17" | 16" | 16—¼" to 16" | 75" | | |
| No. 2 Model CH Plain, Universal and (sliding head) Vertical | 50" x 12" | Long. 28" | 28" | 16—¼" to 32" | 150"—plain & vert. 100"—universal | 50 | 16 — 25 to 1500 RPM |
| | | Cross 10" | 12" | | | | |
| | | Vert. 18" | 15"* | 16—⅜" to 16" | 75"—plain & vert. 50"—universal | | |

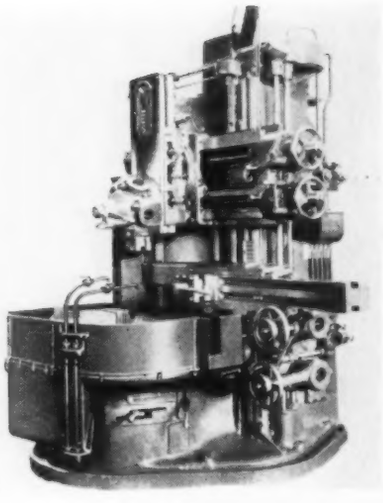
*Add 4" vertical travel for sliding head

If you're looking forward to modernizing your tool-room or milling machine line—you can't afford to overlook these new 3 and 5hp knee types. They offer you more practical operating features and heavier construction than any comparable equipment. They're designed to answer today's milling needs — and tomorrow's as well. For complete data on these machines, contact your nearest Kearney & Trecker representative or write direct. Kearney & Trecker Corp., 6784 West National Avenue, Milwaukee 14, Wisconsin.

KEARNEY & TRECKER MILWAUKEE MACHINE TOOLS

# NEW *equipment*

**new and improved production ideas, equipment, services and methods described here offer production economies . . . fill in and mail postcard on the opposite page.**



## *Niles side head mill has higher table speeds and power*

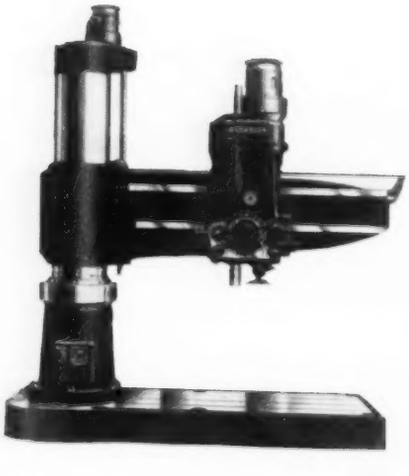
A new 42-in. vertical boring and turning mill with side head has been modernized by increased table speeds and corresponding feed changes; by use of anti-friction bearings in the table speed change gear box and table mounting; and by a higher powered drive from a 30-hp motor. The machine combines the advantages of turret lathe, engine lathe, and vertical boring and turning mill, with independent or simultaneous engagement of down and cross feed or power traverse for both rail head and side head. Centralized and simplified controls for multiple tooling make it adaptable to job shop or quantity production. Actual swing with side head down is 50 in. Distance from table top to turret face is 48 in. Vertical head, with five faces, has a 28-in. slide travel and swill swing 45° to either side. The side head travels 35 in. vertically, 21 in. horizontally. *Baldwin-Lima-Hamilton Corp.*

**For more data insert No. 1 on postcard.**

## *Multi-dimension inspection machine can sort pieces*

This inspection machine, manufactured by Sigma Instrument Co., Ltd., checks pieces simultaneously for inside and outside diameters, depths, profiles, tapers, concentricity, squareness of surfaces, threads and other characteristics. Inspection results are shown by signal lights on a panel—OK within limits, a master green light; on the plus side, a yellow light for each dimension; and on the minus side, a red light for each dimension. The machine is available for hand, semi and fully automatic operations. Setups can be changed in 20 min. The fully automatic machine has a device to sort pieces into groups. Gages are made in four types with measuring ranges from 0.060 to 0.010 in. *Cosa Corp.*

**For more data insert No. 2 on postcard.**



## *Radial drilling machines feature hydraulic control*

Pre-selection of speeds and feeds, hydraulic control and automatic locking are features of Archdale heavy duty radial drilling machines that are built in sizes from 5 to 12 ft spindle radius. Twenty-two speeds range from 11 to 1450 rpm and 18 feeds, 12.5 to 675 rpi. Speeds and feeds can be preselected at any time, whether the spindle is running or stationary, and are changed automatically when the clutch lever is moved either to forward or reverse position. A precision depth trip insures uniform accuracy of depth. The sleeve is locked to the pillar and the saddle on the arm simultaneously by a pushbutton. The machine cannot be damaged by a mistake in operating controls. Safety trips prevent over-traverse of arm and spindle, and safety clutches safeguard the speed and feed drive. Drilling capacity is up to 3¼ in. diam from the solid in mild steel. *James Archdale & Co. Ltd.*

**For more data insert No. 3 on postcard.**

***Turn to Page 36***

# FREE *publications*

**These publications describe money-saving equipment and services... they are free with no obligation... just fill in and mail the postcard.**

## *Heat processing machines*

The importance of heat-processing machines as automatically controlled precision tools in production lines is highlighted in a new bulletin "Precision Tools for Production." Descriptions and illustrations include metal brazing, selective hardening, heating-for-forging, tinplate fusion, melting, normalizing. *Selas Corp. of America.*

**For free copy insert No. 20 on postcard.**

## *Circuit breaker panels*

Circuit breaker panelboards for the control and protection of lighting, appliances, and other electrical applications are described in a 20-p. booklet. The equipment safeguards installations against shorts and dangerous overloads while minimizing circuit interruptions and outages. De-ion circuit breakers for a complete range of industrial and commercial requirements in capacities from 10 to 600 amperes, are described. *Westinghouse Electric Corp.*

**For free copy insert No. 21 on postcard.**

## *Materials handling picture*

How 80 pct of the unskilled labor in the average plant is used to move production materials and equipment . . . how 22 pct of industry's pay roll goes to pay for this handling (making it the largest single labor cost in average plant), these are the subjects of a new motion picture on industrial-truck usage. Entitled "The One-Man Gang", it is available for showings in plant offices and requires 30 min. *Towmotor Corp.*

**For free copy insert No. 22 on postcard.**

## *Data on viscosity*

A literature package that includes an 8-page catalog, data sheets, price lists and other material is available on the Brookfield viscometer and the general subject of viscosity. The various models of viscometers and their operating characteristics are described and illustrated. *Brookfield Engineering Laboratories, Inc.*

**For free copy insert No. 23 on postcard.**

## *Tool accessories*

A new, enlarged catalog of rotary tool accessories includes details on felts, brushes, abrasives, mounted wheels, points and other equipment. Descriptions of accessories are given, complete with sizes, construction details and other characteristics. *Precision Supply & Machine Co.*

**For free copy insert No. 24 on postcard.**

*Turn to Page 102*

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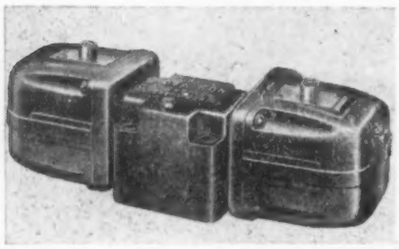
# *new equipment*

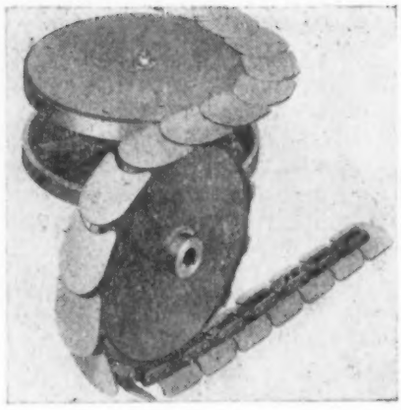
***Continued***



## *Valve ends spool-sticking in high pressure circuits*

To overcome the problem of spool-sticking common to 4-way solenoid valves in high pressure hydraulic circuits used for long cycling operations, a pilot operated valve has been developed that utilizes system pressures to move the spool. Spool action is said to be smooth, quick and positive under all operative conditions to 5000 psi. Three-fourths and 1½ in. sizes, in single and double solenoid types are available. *Denison Engineering Co.*

**For more data insert No. 4 on postcard.**



## *Flat top conveyer flexes horizontally and vertically*

A new flat top conveyer that flexes in two planes can curve around corners with a radius of as little as 6 in. with ease. Designed primarily for tip-free conveying of bottles, jars, packages or small parts, the advantage of the Flextop is its elimination of transfer points in the conveyer system. Flextop consists of carbon or stainless steel crescent-shaped top plates mounted on links that are connected by a universal joint. The plates are induction welded to the chain links. The chain operates over cut-tooth sprockets and around horizontal idler disks, 14 in. in diam at corners. Speed at which the chain can be run is determined by the product being handled and by the length of conveyer. The conveyer can be driven from one power source. *Chain Belt Co.*

**For more data insert No. 5 on postcard.**

## *Quick-acting cleaner*

A powerful new soak solvent has been designed for the quick removal of buffing and drawing compounds from knurled or fluted surfaces of all metals. Dynakleen will remove all types of soils including greases, oils, discolorations in less than a minute. It requires no heating or special tanks, and can be used in spray washing machines or applied by hand. The safety solvent dries quickly and can be used over and over with only occasional filtration. *Du-Lite Chemical Corp.*

**For more data insert No. 6 on postcard.**

## *Electric hammer drill*

A new electromagnetic hammer drill for high-speed hole drilling in concrete, brick and stone, has a 1⅛ in. drilling capacity, weighs 21½ lb and is available for operation from 110 v ac or 220 v ac. Automatic rotation of the carbide-tipped, spiral-fluted drill speeds up hole drilling, eliminates manual turning of the drill chuck and reduces fatigue. *Syntron Co.*

**For more data insert No. 7 on postcard.**

***Turn to Page 38***

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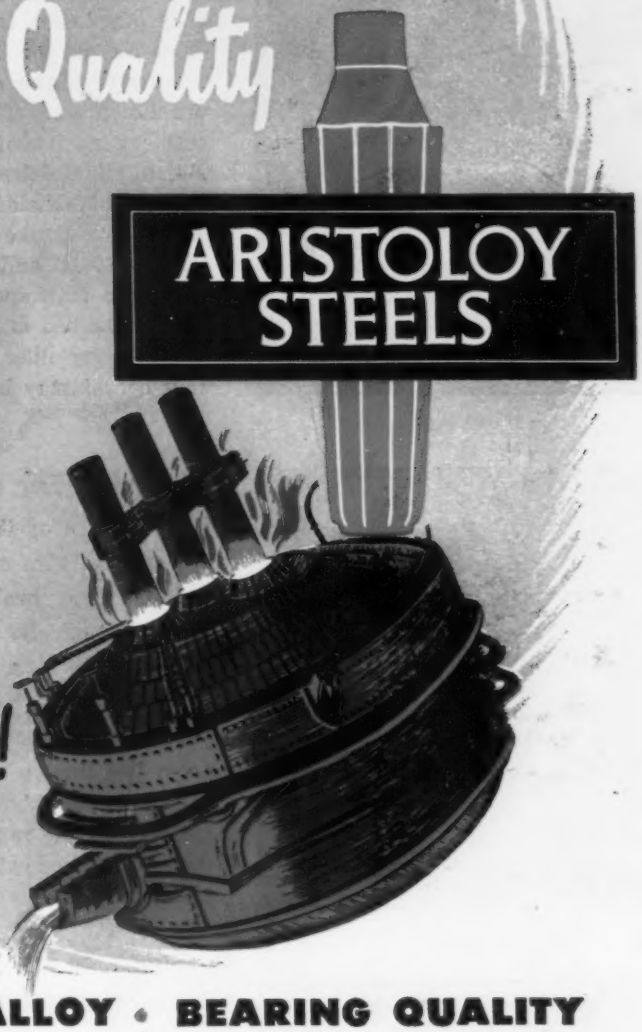

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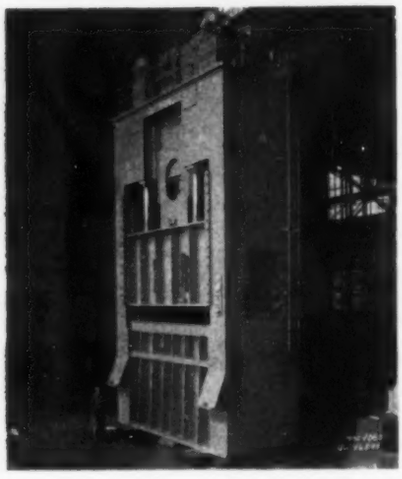
SCRAP IS VITAL

# *new equipment*

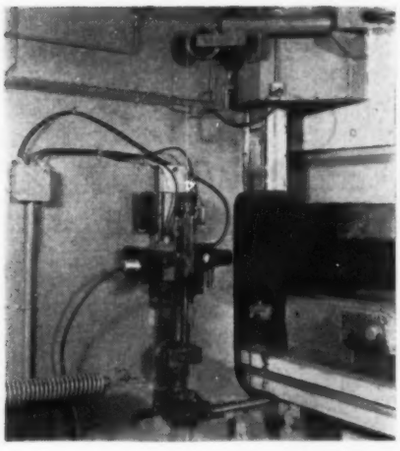
*Continued*



## *Hydraulic press permits quick change for many jobs*

Unusual flexibility for quick and easy adaptation to a great variety of work is the most interesting feature of a new double action hydraulic press. The press has a frame capacity of 1500 tons, the punch slide delivering 1000 tons and the blankholder slide 500 tons. Maximum stroke of the punch slide is 80 in. and the press is arranged to draw and lift out a 30-in. piece. The bed is 96x162 in. With an auxiliary filler plate, minimum shut-height may be 20 in. for first draw or shallow die work; without plate minimum shut-height is 50 in. Three pressing speeds are available with quick advance and return. Each speed can be used singly or seven sequences of automatic operation may be chosen by means of selector switches. Three hydropneumatic cushions have independent pressure adjustment to 150 tons on each cushion. Cushion stroke is 30 in. The press is driven by two 220 hp motors. *Clearing Machine Corp.*

**For more data insert No. 8 on postcard, p. 35**



## *Photoelectric device controls press brake ram motion*

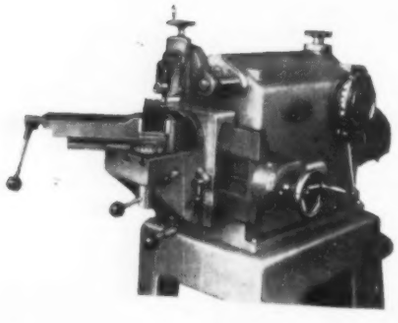
Through use of the GE electronic system, the ram on a new Verson 1000-lb press brake may be held level through its stroke, or may be operated at a pre-selected degree of tilt down to 0.001 in. A booster pump, used to transfer oil from one line to another to maintain position synchronization of the ends of the ram, is driven by a motor supplied by an amplidyne generator, that is controlled by the photoelectric system. Any tilt of the ram raises or lowers a barrier suspended between the photoelectric cell and the light source. Movement of this barrier as much as 0.001 in. results in automatic correction through altered speed and direction of the oil flow from the transfer pump. The press brake is hydraulically operated. *General Electric Co.*

**For more data insert No. 9 on postcard, p. 35**

## *Special machine produces exhaust manifolds*

Only one operator is required to process 130 automobile exhaust manifolds at 100 pct efficiency, on a new special machine. Operations include milling the joint face, the hot-spot pad and the tailpipe pad; drilling, reaming, chamfering and tapping all holes; and boring the tailpipe hole. The machine has ten stations including one for loading; four for milling; four for drilling, reaming and boring; and one for tapping. Pieces are carried on a palletized workholding fixture between stations and during all operations. *Cross Co.*

**For more data insert No. 10 on postcard, p. 35**



## *Short stroke shaper has all-hydraulic design*

Simplicity in operation and, due to an overflow valve, safety against breakage of machine, tool or work make this Bartsch universal all-hydraulic short-stroke shaper a useful machine-tool for every shop. The ram as well as two guides are cylindrical steel, and are supported by conical adjustable bushings. The 8-in. stroke is controlled by two ball-shaped handles and cutting speeds can be varied from 0 to maximum 65 fpm by turning a handwheel through 90°. Controls can be adjusted while the machine is running. *Dr. Walter Riesenfeld.*

**For more data insert No. 11 on postcard, p. 35**

***Turn to Page 106***

# INTRICATE LARGE CASTINGS ...readily produced in DUCTILE IRON

**DUCTILE IRON** is a cast ferrous product that combines the *process advantages* of cast iron with many of the *product advantages* of cast steel.

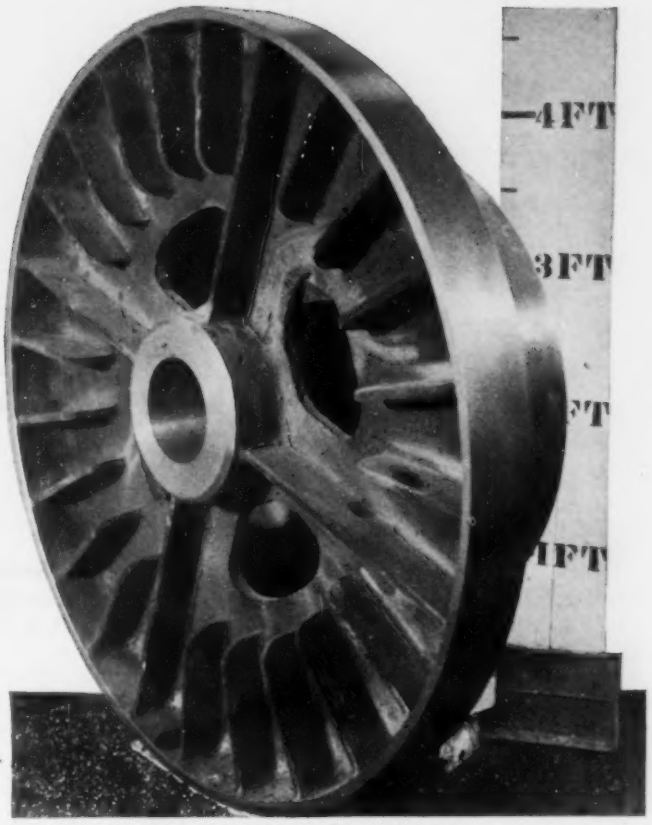
In less than two years, ductile iron has attained wide acceptance because it offers excellent castability, high mechanical properties, and good machinability. Parts cast in ductile iron show superior pressure tightness, high modulus and resistance to shock.

Typical current applications include chemical pots, compressor shells, cylinders for hydraulic presses, fly wheels, housing for electric power driven tools, large gears for coal mine equipment, vise jaws, and many other parts.

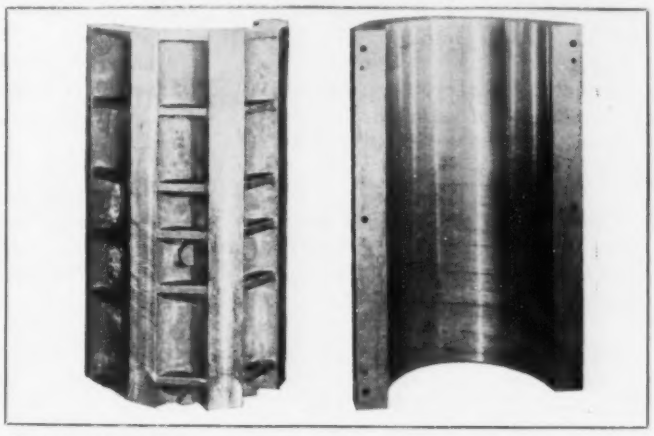
### AVAILABILITY

Send us details of your prospective uses, so that we may suggest a source of supply from some 100 authorized foundries now producing ductile iron under patent licenses. Request a list of available publications on ductile iron...mail the coupon now.

**ST. PAUL FOUNDRY & MANUFACTURING CO.**, St. Paul 3, Minn., cast this hydraulic head for a billet conditioner in ductile iron having 92,000 p.s.i. tensile strength, 67,000 p.s.i. yield point and 7.8% elongation.




**STAVER FOUNDRY COMPANY**, Virginia, Minn., produced this large hoist drum in ductile iron to meet requirements of toughness with strength, and wear resistance with good machinability.



**PYOTT FOUNDRY & MACHINE CO.**, Chicago 7, Ill., produced these ductile iron castings for dies for forming 24" to 36" diameter pipe from steel plate of ¼" to ½" thicknesses. The finished tooling was done by the Vernon Allsteel Press Co. of Chicago. The dies are to be used in large presses that exert 18,000 tons pressure.

The International Nickel Company, Inc.
Dept. I.A., 67 Wall Street, New York 5, N. Y.

Please send me a list of publications on: **DUCTILE IRON**

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**THE INTERNATIONAL NICKEL COMPANY, INC.** 67 WALL STREET NEW YORK 5, N.Y.

# IRON AGE *introduces*

**Simon D. Strauss,** elected to the board of directors of REVERE COPPER & BRASS, INC., New York. Other board members elected: **Charles A. Macfie, J. Aylmer Doucett, Irving T. Bennett** and **James M. Kennedy.**

**Steward W. Varn,** appointed assistant to the vice-president in charge of sales of INLAND STEEL CONTAINER CO., Chicago.

**Curry W. Stoup,** elected to the board of directors of HARRY FERGUSON, INC., Detroit.

**James C. Barney,** appointed assistant manager of sales, wire rope division of JOHN A ROEBLING'S SONS CO., Trenton, N. J.

**Charles B. Cobun,** joined the Chicago district sales office of HEPPENSTALL CO., as an assistant to the district representative.

**Chalmer J. Carothers,** appointed merchandising supervisor, wiring devices of SYLVANIA ELECTRIC PRODUCTS, INC., New York.

**John J. Alexander,** appointed superintendent of steam and power at REPUBLIC STEEL CORP.'S Cleveland district. Mr. Alexander succeeds **Harry Stott,** who has retired after 36 years at the Cleveland plant.

**Dr. L. D. Barrick,** appointed manager of the new Fine Chemicals Div. of PITTSBURGH COKE & CHEMICAL CO., Pittsburgh. **R. M. Locke** will assist Dr. Barrick.

**A. Walter Hefti,** joined the home office staff of WYANDOTTE CHEMICALS CORP. **Robert K. Tucker** becomes manager, St. Louis district and **Tom R. Todd** becomes manager, Los Angeles district.

**Howard C. Swain,** appointed assistant district manager for the Pittsburgh district of U. S. STEEL SUPPLY CO.

**John E. Ward,** appointed chief inspector, Youngstown district, for the YOUNGSTOWN SHEET & TUBE CO.

**Ira G. Needles,** elected president of the B. F. GOODRICH RUBBER CO. OF CANADA, LTD., Kitchener, Ontario.

**Duncan B. Gardiner,** appointed assistant chief engineer for VICKERS, INC., Detroit, a division of the Sperry Corp.

**Ellsworth E. Roth,** named assistant to the works manager, Kalamazoo, Mich., of the Ingersoll Products Div. of BORG-WARNER CORP.

**Dana P. Blake,** appointed works manager of PACIFIC NORTHWEST ALLOYS, INC., Mead, Wash. **Eugene Monroe** was named manager, magnesium plant.

**Walter B. Siegel,** appointed general personnel and industrial relations manager for SOULE STEEL CO., San Francisco.

**James W. Kent,** promoted to the position of buyer, scrap procurement, for KAISER STEEL CORP., Los Angeles. **Brooks Kitchel** was appointed purchasing agent at the Fontana Works and **Curtis Bonneville** was named general foreman, merchant-skelp mill.

**John C. Buckwalter,** appointed chief engineer of the DOUGLAS AIRCRAFT CO., Long Beach, Calif., division.

*Turn to page 52*

GEORGE L. STEWART, appointed executive vice-president of the Monarch Steel Co., Hammond, Ind.

W. B. PROSSER, elected a vice-president of Perfect Circle Corp., Hagerstown, Ind.

ALBERT L. WILLIAMS, elected to the board of directors of International Business Machines Corp., New York.

# IRON AGE

# *salutes*

*Harry W. Bockhoff*

IT was in 1917 that young Harry Bockhoff contracted with his father to paint the entire shop of National Automatic Tool Co. for $14.68. After 2 days, with only two bays painted, he realized he hadn't figured the price right. Pointing to the obvious error in his original estimate, he asked to renegotiate, but his father held him to the contract.

This is a lesson Harry never forgot. And it helped him follow a course in business that has been rewarded with a reputation for dependability and integrity.

He practically grew up with the machine tool industry. He'll talk tools 'til the cows come home. His special forte is multiple-spindle drilling, and he's proud of the developments pioneered by NATCO since their first machine in 1901.

Harry has first hand knowledge of the part played by tools in two world wars; he doesn't have to be sold on the need for them today. As a past director of the National Machine Tool Builders Assn., he knows what his industry is capable of doing, given half a chance.

He's both a planner and a doer. When the present emergency struck, he had his own expansion program ready. Instead of just now gearing up, NATCO is already completing expansion of engineering and welding facilities.

He believes in united effort. Right now he has swung the full weight of NATCO's hundreds of employees behind the Nation's big production push. He thinks this is a fitting way to celebrate the fiftieth anniversary of the firm he heads.

HAROLD J. THOMPSON, appointed manager of consumer products sales for International Nickel Co.'s Inco Nickel Alloy Sales Dept.

T. W. MERRILL, appointed chief metallurgical engineer of the Vanadium Corp. of America, New York.

HARRY W. HUGHES, appointed West Coast manager by Brainard Steel Co., San Francisco.

J. L. COLEMAN, Jr., elected president of Sauer, Inc., Pittsburgh.

# IRON AGE *introduces*

***Continued***

**A. C. Bishop,** elected chairman of the board of directors of FERRO ENGINEERING CO., Cleveland, and **G. A. Peterson** was elected president. **Walter M. Charman, Jr.,** was named executive vice-president and **P. R. Ward** was newly elected a vice-president.

**E. J. Pavesic,** appointed director of research; **N. O. Kates,** works metallurgist; and **F. J. Minch,** metallurgist of the LINDBERG STEEL TREATING CO., Chicago.

**Glenn A. Mooney,** appointed administrative assistant to the director of engineering and research, Atomic Power Div., WESTINGHOUSE ELECTRIC CORP., Pittsburgh.

**W. J. Maurer,** named general production manager in charge of DETROIT STEEL PRODUCTS CO.'S six plants. **John E. Bloomstrom** has been named director of industrial relations.

**A. E. Carter,** named manager, manufacturing department of DEARBORN MOTORS CORP., Birmingham, Mich.

**Louis S. Gleason,** named superintendent, chemical department's plastics molding plant at Decatur, Ill., for GENERAL ELECTRIC CO. **C. F. Coffin** was appointed Atlantic district representative and **J. F. Nounnan** has been assigned to the Central district with offices in Omaha, Neb.

**Leonard J. Freeman,** appointed district field engineer for the marketing area of Eastern Iowa and Northern Illinois with the exception of the immediate vicinity of Chicago for DENISON ENGINEERING CO.

**Charles H. Kuthe,** appointed manager of the product development department of Wolverine Tube Div. of CALUMET & HECLA CONSOLIDATED COPPER CO., Detroit.

**Charles P. Betz,** appointed general superintendent of the Blast Furnace Div. of GREAT LAKES STEEL CORP., Ecorse, Mich.

**A. S. Cogan** and **William M. Bain,** appointed to the ammunition department of the research and development division of OLIN INDUSTRIES, INC., East Alton, Ill.

**W. C. Powell,** appointed gener sales manager for the A. O. SMIT CORP'S north central district wi headquarters at Chicago. Mr. Pow will direct sales and administrati personnel in 14 states in the upp Mississippi river valley.

**Howard E. Hornickel,** named wor superintendent, Donora Zinc Work Donora, Pa., for AMERICAN STEE & WIRE CO.

**James L. Womer,** appointed ma ager of the Pittsburgh sales offi of the NATIONAL RADIATOR CO succeeding **Charles F. Morrow,** wh has retired after 43 years of servic

**Orvis L. Johnson,** joined the staff SUPERIOR STEEL & MALLEABL CASTINGS CO., Benton Harbo Mich., as superintendent of the ma chining and assembly division.

**Ray F. Sparrow,** elected executiv vice-president of P. R. MALLORY CO., INC., Indianapolis. **Harold Buell** has been promoted to vice-pre ident in charge of sales to succeed M Sparrow. **James L. Wellinger** wa elected comptroller.

**L. J. Griffiths,** appointed assistan comptroller of BALDWIN-LIMA HAMILTON CORP., Philadelphia.

**Robert K. Baxter,** elected vice-pres ident and general manager of th ADVANCE SPRING CORP., Chicago

## OBITUARIES

**Edward B. Harkness,** retired U. S Steel subsidiaries executive in Chi cago. Mr. Harkness was 76.

**B. Howard Lester,** retired, prom nent New England steel scrap dealer

**Eugene L. Beisel,** vice-president o the Moto-Truc Co., Cleveland.

**William C. Johnson,** 49, executiv vice-president of Allis-Chalmers Mfg Co. Mr. Johnson was a member of th board of directors, also a member o the executive committee of the board

**Alfred G. York,** director and vice president of the Watson-Stellman Co Roselle, N. J., at his home in Elizabeth, N. J.

**T. J. Mosher,** 74, chairman of th board of the Mosher Steel Co., Dalla Mr. Mosher was the son of the found der of the company.

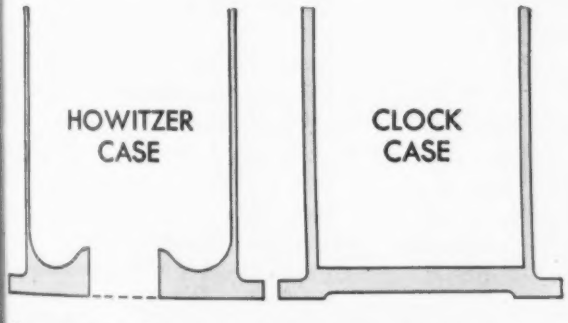
Chelsea Ship's Bell Clock, The Vanderbilt model, made by Chelsea Clock Co., Chelsea 50, Mass. Case drawn in one piece out of commercial brass by Worcester Pressed Steel Co., Worcester 6, Mass.

# War Baby grows into a Clock Case

During the War, the Worcester Pressed Steel Co. worked out a technique for forming 4.5 howitzer shell cases of cartridge brass. The case was 3¾" high, 4¾" o.d., with thin walls and thick base that included a difficult flange, the material for which had to flow entirely from the base of the cup. The successful solution of the many problems required careful tool design, plus skilled control of each operation.

Later the Chelsea Clock Co. asked Worcester if it could cold-form clock cases out of commercial brass. A study of the clock case revealed striking similarities between it and the howitzer case, but on the other hand there was one important difference. The large radius on the inside of the howitzer case was not permissible in the clock case, because of the space required for the works. It was found that the bottom design could be achieved by squaring the case to the exact height, providing the bottom knockout with exactly the correct amount of spring tension in the restrike, and carefully governing the pressure and speed of press travel. The complete coordination of these factors resulted in a perfect case, and another example of the adaptation of war-learned skills to peace-time products.

• If you have problems in connection with the fabrication of copper and its alloys, or aluminum alloys, remember that the Revere Technical Advisory Service often can be helpful.




Cross sections showing similarities and differences between the howitzer case and the clock case.

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# *on the assembly line*

*automotive news and opinions*

**The great debate on Detroit unemployment gathers steam . . . Labor restive as materials outlook darkens . . . Chevrolet expands**

*by Walter G. Patton*

**Change of Heart?**—For political reasons it is expedient to say that Detroit is "farming out" too much of its defense work. That's why President Truman said so during his brief stay in Detroit last week at the 250th Anniversary celebration. Defense Mobilizer C. E. Wilson repeated the charge later the same evening. UAW-CIO leaders have been saying the same thing for several months. All this while Washington small business committees expound on the benefits of subcontracting.

It's also curious that while the politicians say Detroit is dispersing its defense contract work too widely, small business men from the hinterland are charging Detroit with hogging all the defense work.

**Defense Rests**—GM was the first auto producer to answer the "farming out" charge. Pointing out that in June 1950 the company had 56,273 employees in Detroit, C. E. Wilson, president, said the corresponding figure for June 1951 was 56,137.

Wilson emphasized that GM defense work is being distributed to all plant cities but that defense production can't be turned on merely by shutting off automobile production.

**Getting a Scapegoat**—Union spokesmen are going much further with their cry of "needless" unemployment in Detroit. Union publications are saying that the greed of auto manufacturers and poor governmental planning has resulted in widespread worker layoffs that might have been avoided.

The union asserts that by keeping auto facilities intact and keeping the "lush" profits rolling, the Big Three plans to manufacture defense products in other areas and realize "lush" profits from that source, too. How the union is able to justify its position to its members outside Detroit is not clear.

**Can't Do Both**—The great debate over Detroit's employment situation has reminded wags of a cartoon which appeared in a local publication many years ago. A teen-ager, all dressed up for his first big party, was getting a last word of advice from his admiring mother. "Be a good boy, John," she said, "and have a good time." The boy's reply was: "Make up your mind, Mom."

**Scope of Planning**—While production of defense products has gotten under way but very slowly, defense planning is on a national scale. Chevrolet offers an example. Chevrolet defense work is being expanded in plants in Detroit, Saginaw, Flint, Indianapolis, Muncie, St. Louis and Buffalo. Chevrolet has let contracts for 10,000 tons of structural steel needed for three new aviation engine buildings at Tonawanda, N. Y. The GM division will build both Wright Cyclone and the Wright turbo compound engine. The Wright Cyclone is rated at 2700 hp. The turbo compound engine is a 3500 hp powerplant.

Other Chevrolet defense projects include tank transmission assemblies, artillery ammunition and axles and other components for 6 x 6 military trucks.

**Auto Owner's Burden**—How much tax does the average buyer pay on a passenger car? According to the Automobile Manufacturers Assn., the tax burden on automobiles is now 29 pct of the purchase price. This is equivalent to $584 tax on a $2000 automobile.

Meanwhile, Congress is proposing to increase the automotive excise tax from 7 to 10 pct in the case of passenger cars and from 5 to 8 pct in the case of trucks, buses and replacement parts. AMA is protesting vigorously. According to AMA experts, 77 pct of all trips connected with economic activity are made in passenger cars. More than half of this passenger car mileage is necessary, AMA says.

*Turn Page*

# assembly line

*Continued*

**The Pot Seethes** — While the automobile industry still has hopes of reaching its 1,200,000 quota during the third quarter, prospects for doing so are not improving. Detroit labor is restive. Wild-catters have hit Chrysler production so often work stoppages now appear to be a habit. The union has had to appoint a special representative to take over the local at DeSoto where an irresponsible minority has upset production schedules with monotonous regularity. Dodge Main has also been besieged by wild-catters.

Ford-Monroe is taking a strike vote this week. The Hudson labor controversy continues to drag on. The union is hurling charges of a lockout. It has urged its members to seek jobs elsewhere. The company remains silent. Mediation is being tried by the State of Michigan.

**Steel Supply Muddle**—The steel picture, particularly auto steel, is in the worst muddle since auto production was resumed following World War II. District steel offices are swamped with paper work. Some CMP orders sent through by the industry are already being returned because available mill space has all been used up. Just how a 100 pct CMP is going to help this situation is not clear.

Most critical item is probably carbon and alloy bars. Any interruptions to steel production that may occur will have to be deducted from the 15-20 pct of free steel. Inventories of bars are believed to be at the lowest point since 1945.

At the moment it looks like a race between bar steel and copper to see which shortage will hit the industry first.

**Continue Conversion** — Despite the gloomy outlook, most automobile firms are hopefully planning for continued production at close to the 1,200,000 per quarter rate. While some conversion steel deals may be cut back, even independent manufacturers are continuing to take conversion ingots.

In some cases the ingots are traded for forging billets which can be used, for example, for crankshafts. Partly because of the critical scrap situation and other factors, ingots for conversion are difficult to get even in the face of declining auto output.

**Boron to the Rescue**—Metallurgists who are not sleeping well these days may blame it on the acute alloy situation. As now constituted, both the aircraft gas turbine and tank programs call for more alloy **than is being produced.** Past experience indicates it may take as much as 7 years for industry to get full and satisfactory use of a new alloying metal for steel.

Probably the brightest aspect of the alloy picture today is the fact that experience with boron, while limited, stretches over a period of more than 10 years. Boron steels are expected to be produced in large tonnages in September.

**Building in Buffalo**—Chevrolet is adding a million sq ft of new buildings in the Buffalo area, bringing the Chevrolet-Buffalo operations to more than 3 million sq ft. The new space will be used to produce Wright R-3350 aviation engines for the Air Force and the Navy.

Approximately 370,000 sq ft will be added to the Chevrolet foundry which will produce castings for aircraft engines. The Chevrolet-Buffalo forge plant will have a new building comprising 230,000 sq ft, also needed for the aviation engine.

**Expansion Reasons**—The new buildings will have heat absorbing glass. A number of innovations in artificial lighting will be employed.

Announcing the Chevrolet plans, T. H. Keating, Chevrolet general manager, emphasized that availability of men and women seeking employment, ingot capacity of the steel industry in the Buffalo area and availability of subcontractors were important factors dictating Chevrolet's expansion plans at Buffalo.

**THE BULL OF THE WOODS** — **By J. R. Williams**

LOOK, I HAD THAT REPAIR GANG MERELY PUT A NEW SCREW IN MY VISE, AND YOU'D THINK THEY TOOK A LOCOMOTIVE APART!
OH, THEY'RE LIKE THE OLD FRONTIERSMEN--THEY'D NEVER GIVE UP THAT WILD, ROVING, ROUGH LIFE FOR OUR SHELTERED EXISTENCE, BUT THEY LIKE TO RUB IT IN!
KEEP MOVIN'! ONE TOUCH AND YOU'LL HAVE HOLLOW KNUCKLES!
8-10
J.R.WILLIAMS
THE DUDES
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# west coast progress report

*digest of far west industrial activity*

*by R.T.Reinhardt*

**Much Smoke, Little Fire**—In spite of the confusion of CMP, it would be difficult to find any metalworking plant in the Pacific Northwest where production has been seriously curtailed.

There have been some dislocations of supply and rejections of allocated orders, but on the whole production of nondefense as well as defense products continues at a profitable level. However, even those plants operating at levels well above "normal" often publicly decry limitations, but their executives will privately admit business is good.

**Proof of Pudding**—Pacific Car & Foundry at Renton, Wash. is turning out 11 railroad cars per day, working on orders for a total of 1600 cars. At the same time it is hitting an all-time high for 3 straight months in its production of tractor equipment. As an important sideline, the company is building a prototype of a mobile gun mount for which it has a production order.

Iron Fireman Mfg. Co. in Portland, currently engaged in subcontracting for air-frame manufacturers, last week announced a $100,000 improvement program and is increasing its payrolls.

**Launch Barge** — Gunderson Brothers Engineering Corp. in Portland, Ore., will launch the first of 23 steel barges for the government early this month and by October will be producing one a week. Additional barge contracts are expected. Employment is going from 220 to 450 within a few months.

Willamette Iron & Steel Co., one of the largest metal users in Portland, is working at capacity on special custom products and ship repairs with 600 employees.

**Own Facilities**—Electro-Metallurgical Co., which has been assembling its carbide drums from shapes shipped into Portland, will soon have its own facilities for complete fabrication of drums from 26-gage cold-rolled steel at the rate of about 50 tons per month.

Structural steel fabricators in the Northwest are not complaining about the volume of work at hand in spite of building restrictions. Unquestionably this volume could be increased if steel were more abundant, but even under present conditions business is at near capacity.

**Scrap Dealers Squeezed**—Dealers in iron and steel scrap aren't complaining too loudly, but it appears that the difference in what they pay collectors and what the OPS allows them to charge steel producers is not as large as it should be to allow a fair profit.

In the Northwest this spread is about $2.25 per gross ton on the better grades. Reputable dealers state that if it were not for the salvage involved they couldn't afford to handle scrap. With inventories falling well below those estimated and reported by the government, a review of the price ceilings on scrap may be in order if the high rates of ingot production are to be maintained during the winter.

**Ingot Handling**—Oregon Steel Rolling Mills in Portland, Ore., is trying a new method of handling its small ingots which is expected to reduce costs. Instead of a conventional craneway to move ingots from stripping shed to storage, they are using a special 9-ton capacity fork lift truck which handles pellets of ingots weighing up to 5 tons.

Ingots of from 500 lb to 1200 lb are cast and taken to yard storage before reheating and rolling. Capacity of the lift truck made by Gerlinger Carrier Co. of Dallas, Ore. is 9 tons.

**Takes a Breather** — Kaiser-Frazer Corp. closed its Portland, Ore., assembly plant at the end of last month after having produced about 2500 Kaisers since last September. Whether it will re-open to assemble the Henry J is still uncertain, but the plant is expected to be activated soon in some capacity, either defense work or products for the cosumer market.

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It's been proved in mills everywhere! *In actual service,* the EP (Extreme Pressure) properties of *Texaco Meropa Lubricants* stand up better than other reduction gear lubricants. Even after months of hard service, EP characteristics are maintained. No wonder gears last longer, maintenance costs come down!

*Texaco Meropa Lubricants* also rate tops for resistance to oxidation and thickening. They do not foam, do not separate in service, storage or centrifuging. And you can count on them to protect bearings from corrosion.

For long-lasting protection of oil film roll necks, use *Texaco Regal Oils.* They're turbine-grade oils especially designed for heavy duty service – with extra-high resistance to oxidation, emulsification and sludging.

For cost-reducing lubrication throughout your mill, call in a Texaco Lubrication Engineer. Just contact the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO

**TEXACO Meropa Lubricants**

**FOR STEEL MILL GEAR DRIVES**

# *the federal view*

*this week in washington*

*by George H. Baker*

**OPS on Spot**—Storm of protest is descending on government price stabilizers as a result of their refusal to grant forthrightly the pricing relief authorized by the new Defense Production Act.

Trouble springs from OPS interpretation of the so-called Capehart and Herlong amendments to the new law. Briefly, the former permits producers and manufacturers to allow for cost increases in computing ceiling prices; latter gives same break to wholesalers and retailers.

**Delayed Adjustments**—Charge is made that OPS "is acting as though it hadn't heard about these two amendments." Actually, here's what the price control agency is doing: Manufacturers are told to get busy and comply with the rollback orders (CPR 30, CPR 22, and others applying to non-metal manufacturers) prepared—but not issued—in June. These orders permitted addition of costs only through Mar. 15. New law authorizes addition of costs through July 26. OPS says manufacturers must comply with the June regulations, and then apply for "adjustments" which it will "consider."

**Jets Need Titanium**—Navy authorities are hopeful that studies in production of titanium will pay off in quantity soon. Earlier this year, Navy announced that expensive production costs of the metal had been substantially reduced. Now the department says it can use 50 million lb of titanium in the 1952-1954 period, if industry can turn out that much. A considerable portion of this required poundage would go into jet engine production. Enthusiasts for the use of titanium in jets point out that, unlike colombium and other scarce materials, titanium can be "home grown" from ample sources in North America.

**Contract Rules Set**—Munitions Board is ready to give final approval to a new set of regulations setting forth contract-termination procedure.

The new rules will be known as Section Eight of the Armed Services Procurement Regulations.

Issuance of the new rules has been delayed while the Pentagon eyes progress of a Senate bill (S 921) giving the General Accounting Office the right to review contract terminations. Senate expenditures committee recently put its OK on the bill, thus permitting GAO to have a finger in all renegotiation pies.

**Long Weapons Parley**—Considerable work will have to be performed at the operating echelons of the North Atlantic Treaty organization before U. S., French, and British officers decide what rifle will become standard for NATO ground forces. Arguments advanced by British Defense Minister Shinwell and his French counterpart, Jules Moch, in favor of rifles of .28 calibre and 7.5-mm, respectively, were familiar to American Army chiefs who backed universal adoption of the M-1. U. S. personnel have fired the British rifle, but are unimpressed with its stopping power.

Strongest argument for standardization is the opportunity to interchange parts and ammunition. There's also the question of tooling up to build a new rifle—and the British .28 calibre weapon is so new that British Infantry will continue using the Lee-Enfield for at least 2 years.

**Whammo Output Seen**—Capacity production of basic metals, linked with zooming output of aircraft and ordnance, pushed total U. S. production in June to 222 pct of the prewar average.

Government economists calculate that machinery output alone has risen more than 25 pct in the past year.

Backlogs of unfilled orders continue to rise. Nearly $55 billion was tied up in this category at the end of June. Transportation equipment (other than motor vehicles) and machinery accounted largely for this amount.

Inland's interest in your steel problems does not stop at our shipping dock.
Your scrap is needed by the steel industry for national defense.

# "Let's try changing the blanking direction", said Cliff

Recently, a large automobile manufacturer was concerned with results of a difficult deep drawing operation . . . the fabrication of steel oil pans. These pans were made from Inland's fully aluminum killed cold rolled steel sheets. For six months, these sheets had been ordered to a thickness of .048" and cut to length 35¼" x 43"—and breakage had run to 3.92% of approximately 36,000 oil pans manufactured.

When Cliff Baker*, one of Inland's mill representatives, was given the problem, he suggested changing the blanking direction—inserting sheets in the stamping machine at right angle to the previous direction.

This meant a simple change in the ordering procedure. The customer changed his dimensional specification for these sheets to 43" x 71" so that the direction of rolling and the subsequent direction of steel grain would conform to this suggested practice.

**Result:** In the following six months, breakage was reduced to 0.75% of 30,000 oil pans fabricated. The number of oil pans scrapped was cut from over 1,400 to approximately 230 in these two six-month periods! INLAND STEEL COMPANY, 38 South Dearborn Street, Chicago 3, Illinois.

**Not actual name*

THE IRON AGE
FOUNDED 1855
TECHNICAL ARTICLES

# High-velocity burners cut FUEL COSTS and FURNACE SIZE

Part I

by L. C. Peskin
President
Thermal Research & Engineering Corp.
Conshohocken, Pa.

**Used with standard accessories, this ram-jet burner has reduced heating equipment volume as much as 75 pct, completely vaporizing and burning gas or liquid fuels. A non-luminous flame produces clean, soot-free convection heat—or heat plus special atmospheres. Burner may be used for reheating, continuous annealing, heat treating, ore beneficiation and refining.**

Although the present combustion systems in industry are relatively inexpensive and easily applied, they have greatly handicapped heat transfer equipment. These systems have serious shortcomings with respect to space consumed for the combustion process, the temperatures and atmospheres achieved in the burning, the distribution of the heat in the combustion zone and the velocities of the resultant combustion gases. All of which has an important bearing on the subsequent heat transfer.

The Thermal Research & Engineering Corp., Conshohocken, Pa., was organized to apply advanced combustion techniques to the requirements of industry. This consisted not only of incorporating these techniques in the burner design, but also in that of the heat transfer equipment receiving the liberated heat energy.

Another important consideration was to insure that the desired results could be obtained with standard types of accessory equipment. It was well known that numerous unique combustion systems had been developed, particularly in connection with the military program. However, most of these depended on extremes in air pressure, materials of construction, metering, fuels and other such factors. These patterns were not followed in the development of the techniques discussed in this article.

The development of combustion equipment to perform high-temperature convection heating was patterned after: A) Maximum heat release per unit volume combustion space; B) theoretical flame temperatures with higher temperatures by

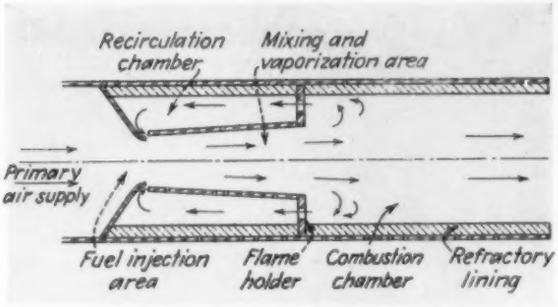


FIG. 1—Schematic, cross-sectional view of new burner, showing flow of primary air supply, recirculation chamber.

regeneration where necessary; C) maximum velocity of the products of combustion, not only as they exit from the combustion space but also throughout the heat transfer equipment; D) greater ratio of heat transfer surface to unit volume, in accordance with modern practice.

The results of this development are now being successfully applied to industrial processes in numerous fields. Some such burners and heat transfer equipment are in productive use. These have shown to a remarkable degree what can be accomplished with this advanced combustion technique.

The Thermal high heat-release burner is applicable to gas, liquid and combinations of these fuels. In either case, the final burning mixture is a gas or vapor available in such a state that extremely high rates of burning are possible. To date, the distillate types of oils, including diesel and ordinary furnace oils, have been successfully used. Extensive work is underway on the burning of residual oils, including the bunker types. The outlook is most promising for successful units in the near future.

### Up to 10 million btu per hr

There are additional developments in the size of burners. Units having capacities of 10 million btu per hr and greater are now possible. Under special conditions, in the case of distillate fuels, burner capacities as small as 20,000 btu per hr have been achieved. The units on which the development is now complete cover, in 3 basic sizes, outputs from 50,000 to 3.5 million btu per hr. The accompanying heat release is, in most cases, well in excess of 1 million btu per hr per cu ft of combustion space.

Though oil enters these burners as liquid through a standard pressure atomizing nozzle, it is vaporized and premixed with the combustion air before the combustion process takes place. This is done without the use of any external vaporizing mechanism for oil or air preheating. As shown in Fig. 1, within the burner there is an annular chamber. It is designed so that differential pressures are created, setting up a recirculation of gases from the burning zone upstream through the recirculation chamber. These gases are reintroduced into the primary air stream at the point of fuel injection.

A combination of mixing and heat transfer takes place, and the atomized oil is vaporized by the time it reaches the downstream face of the recirculating chamber. An abrupt increase in diameter occurs at this downstream face, constituting an annular flame holder. It is at this point that the burning takes place, as a gas mixture. Burning does not take place in the mixing zone due to the velocities being higher than the rate of flame propagation of the mixture.

Mixing and flame holding conditions are such that the burning can be maintained at extremely rapid rates. Stability is such that blow-out is virtually impossible within the limits of economical pressures. Because of the extremely high rates of heat release per unit volume of combustion space, the small volume downstream of the flame holder can be designed to serve as the space required for completing the combustion to whatever extent desired. The products of combustion exiting from this combustion chamber or furnace within the burner are moving at high velocity and at nearly theoretical temperatures.

### Uses standard controls

The burner is equipped with standard ignition and flame control, as well as visual means for sighting the flame. All mechanisms are applied so as to result in a design of the simplest form. Fig. 2 is an external view of a small unit having a capacity up to 300,000 btu per hr. It is approximately 3½-in. OD and about 15-in. long. This unit can be operated as low as 50,000 btu per hr or, with another insert, up to its maximum output of 300,000 btu per hr. In two other standard sizes, 6 and 9 in. OD, maximum present capacity of 3.5 million btu per hr is reached with overlapping ranges. All capacities are based on operation with normal maximum air pressures of approximately 1 psi.

Depending on the application, the external shell of the burner can be all-metal or readily

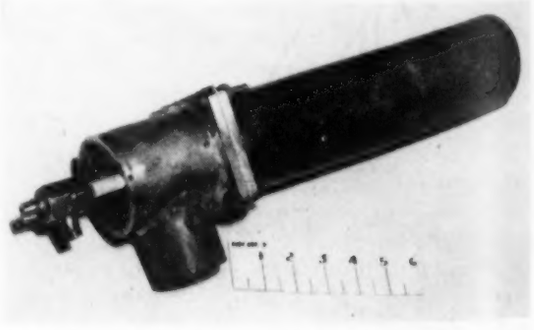

FIG. 2—Small burner having a 300,000 btu per hr capacity. Operates as low as 50,000 btu per hr.

fitted with the usual type of burner tile block. The burner construction is largely stainless steel, with the combustion chamber being lined with an ordinary but high quality refractory.

A new, promising type of burner having unique heat release properties would still have met with considerable opposition from industry if it made present accessory equipment obsolete. While present capacities are based on normal industrial pressures, the same burners can be used without significant change for special applications where higher outputs are desired and higher air supply pressures are available.

The usual combustion chamber or furnace can be eliminated with the Thermal burner. This is because of the extremely high rate of heat release and the resulting short flame. The burner eliminates the need for the large space now required in most equipment for a complete or stable combustion process. The burner delivers a stream of hot combustion gas almost immediately at its exit with little or no additional combustion space.

### Makes smaller equipment possible

In itself, this feature has an immediate effect on the design of the subsequent equipment in which the transfer of the heat takes place. Since it is customary to construct heat transfer equipment around the basic dimensions of the combustion volume, an important change in dimensions, leading at once to smaller equipment, is possible.

While the average theoretical temperatures of a combustion process can be calculated from the composition of the fuel, such temperatures are rarely realized. If the combustion process is carried out in a conventional manner, it occurs over such a length of time that significant heat losses by radiation are possible before the combustion gases can contribute their maximum heat energy.

However, the more important consideration is the matter of temperature, as compared to usual burner operation. Thermal burners provide complete combustion at stoichiometric fuel-air ratios. No diluting excess air is required, although large quantities can be used if desired. The combination of extreme speed of burning and the elimination of excessive air results in a combustion gas several hundred degrees higher than generally considered practical with conventional burners.

### Works with less-than-theoretical air

Mixing is so thorough that even with liquid fuels it is possible to operate the burner with less-than-theoretical air and still maintain clean combustion.

Because of its ability to operate satisfactorily with deficiencies of air this new burner can be operated as both a source of heat and a generator of special atmospheres. It is, in fact, currently being studied for one application where the unit is operating with approximately a 30 pct air deficiency. A furnace oil is the fuel and a clean, carbon-free atmosphere is produced, appreciably higher in CO content than in $CO_2$.

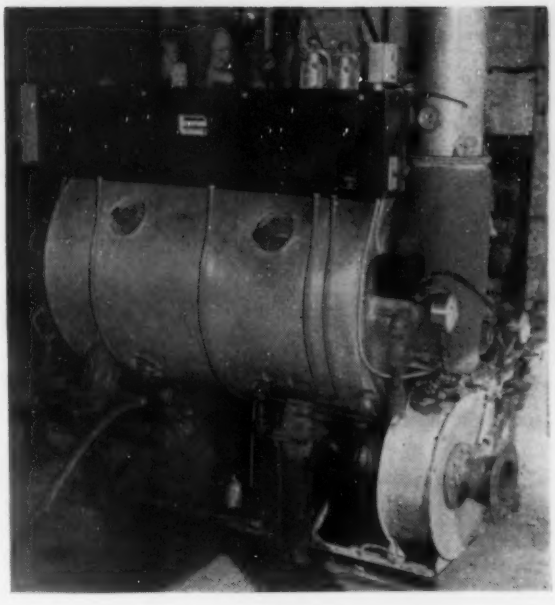

FIG. 3—This steam generator is distillate-oil-fired and is a completely automatic, packaged unit. Only 70x74x37 in., it generates steam at a rate of 2500 lb per hr at 125 psi.

Due to the fact that the air and oil vapor is premixed prior to burning, the flame resulting from the new type of burner is essentially nonluminous. It gives up but a small percentage of its total heat content by radiation from water and carbon-dioxide molecules. The rest of the energy is transferred to the surroundings essentially by convection. The fact that the gases are exiting from the burner at very high velocities is essential to maintaining high coefficients of convection heat transfer.

Heat transfer takes place at rates not generally realized with conventional equipment. The gas velocity may be anywhere from 300 to over 2000 ft per sec, depending upon the air pressures used and the internal design of the burner.

Because the burner gases are essentially nonradiating, the transfer of heat can be governed by the laws of fluid flow. Therefore, it is subject

### How Many Btu's Can You Get?

No more than nature put into the fuel you use. But that's not the whole story. Conventional burners are not made to extract every bit of heat from the fuel they burn. The money and space required to do it makes it impractical, except in those rare cases where capital investment and space consumed are secondary to economical operation.

As normally operated, a standard combustion unit usually yields no more than 50,000 btu per hr per cu ft of combustion space. The new high-velocity burner can and does obtain 1 million btu per hr per cu ft. And it does it while making possible a smaller piece of equipment for the same given heat output.

to more control than is usually possible in ordinary heat equipment, where flame radiation is the dominating factor. By properly proportioning the passages in the heat transfer equipment through which the burner gases must flow, velocities and temperatures are so controlled that the heat transfer is more uniformly distributed.

This is in direct contrast to a highly radiant flame system. There, the radiant energy would have to be absorbed in a more or less concentrated area or partially screened out, if some of the heat transfer surface becomes overheated. This is so even though the temperature in this heating method is likely to be several hundred degrees lower than in the non-luminous combustion system. With the Thermal burner, through convection heat transfer, the combustion gases become a controllable fluid to be proportioned and directed as desired by the design of the equipment.

### Housing Stays at Safe Temperatures

In radiating flame types of combustion, the designer of the heat equipment must strive at all costs to pick up every fraction of energy without overheating the equipment. All this must occur within a relatively narrow region or else the energy is lost. Otherwise, expensive types of economizers are used. In the high-temperature convection system of heating, the boundary layer effects of the high-velocity gases, coupled with the low percentage of radiation from the flame, help keep the various housing materials at safe temperatures.

Another important condition in high-velocity heating systems is that extreme pressure drops are not inherent. Heat transfer is so rapid over a given length of passage that, due to the resulting change in density of the combustion gas, a pressure recovery takes place that very nearly compensates for the drop due to surface friction. Finally, transfer by radiation from the surrounding walls of the gas passage can also be utilized on certain types of equipment where processing is involved, as with continuous strip annealing.

One of the most promising fields for these new burners is steam generation, Fig. 3. This generator is a distillate-oil-fired, completely automatic, packaged unit. The heat transfer section is identical in principle to the well-known Scotch marine boiler. All controls and accessories are standard, applied in a more or less conventional manner. However, this unit, in a cubic volume, 70 x 74 x 37 in., generates steam at a rate of 2500 lbs per hr at 125 psi.

This has been made possible by designing the unit for the Thermal high heat release burner and modifying passage areas to take advantage of high-temperature convection heat transfer. This same type of boiler operating with a conventional burner would have to occupy three

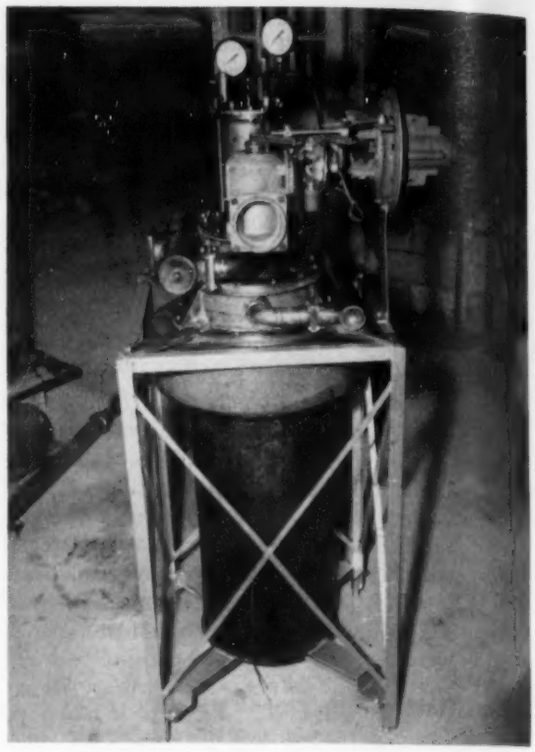

FIG. 4—A high-temperature heat exchanger that can heat 1700 lb of air per hr at 20 psi from 0 to 1200°F.

times more volume for the same rated capacity and pressure. Use in diesel-operated ships and locomotives as well as industry is anticipated.

Fig. 4 shows a high-temperature heat exchanger utilized for heating 1700 lb per hr of air at 20 psi from 0 to 1200°F. The unit operates at an overall efficiency of more than 70 pct and burns diesel or No. 2 oil. The entire assembly, with burner and floor stand, is 75 in. high and 33 in. square and weighs 750 lb. A similar unit has been designed to operate at 135 lb. pressure, heating air or gas as high as 1600°F. Here again, the new burner design makes possible extremely compact heating equipment.

One of the most promising industrial applications now being developed is in the field of direct air heating, as contrasted to heating indirectly through a heat exchanger. Using oil as a fuel, the Thermal type of burning completely vaporizes the oil, providing hot gases as clean and free from soot as those from the ordinary, well-operated gas flame. In previous applications of this kind, it has been necessary to use external vaporizing equipment or externally positioned air preheating burners. In either case, the installations have been cumbersome, requiring appreciable space and maintenance for the auxiliary equipment.

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Part II of this article will appear in next week's issue. Application of convection heating and the high-velocity burner to steel making and heat treatment will be described, complete with a drawing of a prototype continuous strip annealing furnace.

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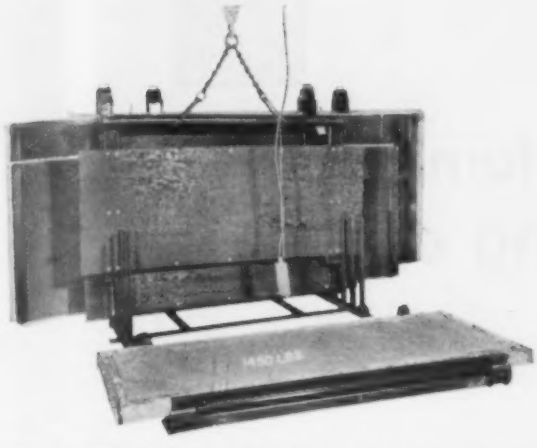
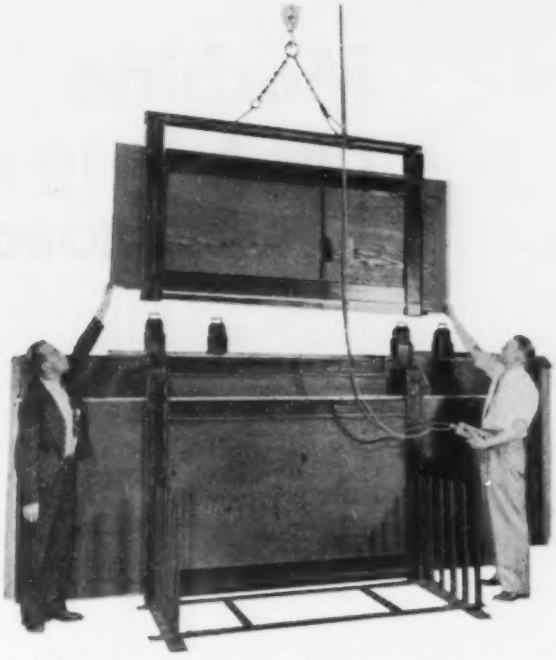
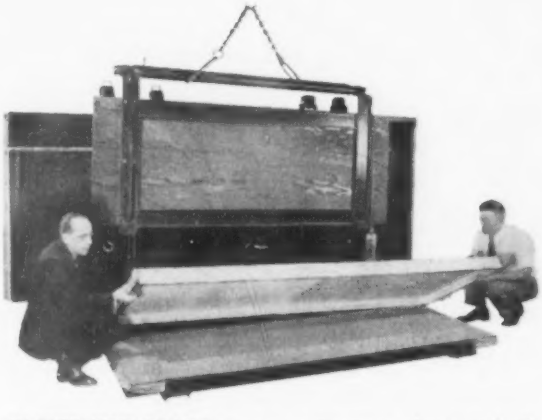
# Sheet metal "Library" saves labor, space



NEWLY RECEIVED crates of sheet metal are placed on a welded steel transfer rack and their tops are removed.



MANUAL HANDLING is virtually eliminated in this sheet metal storage system. Here, a book of sheets is shown on its way to its own individual "library" rack.



AN OVERHEAD CRANE turns over the crate, sheets and all. The crate itself is then removed.

With a heavy, reinforced plywood "book cover" on each side, the sheet metal is then placed in its steel "binding".

Pratt & Whitney Aircraft Div. of United Aircraft Corp., East Hartford, Conn., has reorganized its sheet metal stock into a "library." Storing the 355 different combinations of sheet sizes, thicknesses and alloys in plywood "books" has almost eliminated scratching and other damage. Man-hours required for handling have been reduced 90 pct and floor space 50 pct.

Each book holds a maximum of 1500 lb and one is used for each type of sheet stocked for Pratt & Whitney's turboprop and jet engines. There are 475 of these books in the present storage system.

When a crate of new material is received, only the top is removed. With one of the heavy plywood book "covers" placed over the open side, an overhead crane turns over the crate and its contents. The rest of the crate is then removed and the second cover put in place. These covers are attached to the book's hinges or "binding." The new supply of sheet is then placed in its proper vertical rack, made of welded steel.

To obtain a supply of a particular type of sheet, the book is lifted out of its rack into a "V"-shaped stand, much like those used to hold heavy dictionaries in offices. The sides of the stand open to an angle of 70°, making it easy to lift out the desired amount of material.

When the production line calls for stock, the entire book of sheets can be taken to shears or presses. There, the needed material is taken out and the remainder returned to stock, still in its protective plywood book.

By W. G. Patton
Detroit Editor

# Machine cuts heat treat furnace Loading costs

**An automatic loading machine for a single heat treat furnace is loading small parts at a uniform rate on a 24-hr basis. Fatigue has been eliminated and annual labor savings of $17,500 are estimated on one installation. Furnace output is up 10 pct.**

An automatic loading machine is successfully feeding a single heat treating furnace with small parts of uniform size on a 24-hr continuous basis. Working with screw machine parts and assorted small stampings, the machine has eliminated fatigue in furnace loading and effected marked labor savings. Estimates place the increase in furnace output at 10 pct.

The new loader, in use at Commonwealth Industries, Inc., Detroit heat treating firm, has been under development for more than 2 years. Labor savings estimated at $17,500 annually have been reported.

The loader was first exhibited at the Materials Handling Exposition at Chicago in May 1950, and has been operated by Commonwealth nearly a year. Counting a later model under construction, the company expects to operate three loaders.

The No. 2 loader consists of a series of synchronized, vertically-moving pushers which automatically lift material from a hopper and discharge it in even and regular quantities to the heat-treat furnace.

As shown in Fig. 1 the vertically-moving, cam-actuated pushers are separated by a fixed spacer. This spacer minimizes friction between alternate pushers which move in opposite directions. A variable speed motor with 4 to 1 reduction drive is mounted overhead for easy accessibility. A turnbuckle is inserted in the driving arm to compensate for wear.

The working principle of this automatic loading and metering device is interesting. Parts are fed into a hopper and picked up by the lower pusher as shown in Fig. 2. The pushers move up and down at an angle of 30°. This causes the part to roll or slide down to position on the second moving pusher. Here the parts are raised up to the level of the third step. The majority of the parts then move in a similar manner to the fourth pusher.

The process continues until the parts are deposited on the moving belt feeding the furnace. Some later designs have vertically mounted pushers. On these the steps of the pushers are cut at an angle of 30°.

The metering device is surprisingly accurate. On small parts, quantities delivered do not vary more than 5 pct. On larger, irregularly shaped parts, loads delivered to the belt may be somewhat less uniform. However, it has been found that speeding up or slowing down the number of strokes per minute helps to equalize the amount of work delivered to the furnace. In most parts, the load on the step achieves approximate equalization by the time the third or fourth pusher is reached.

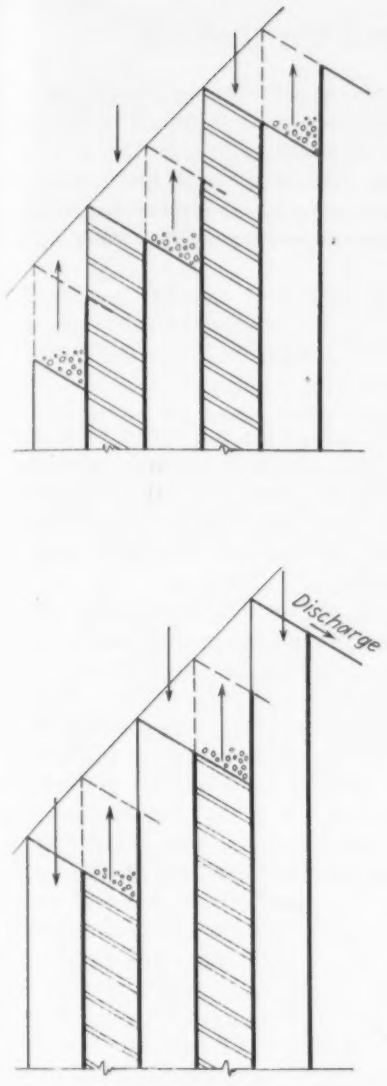



FIG. 1—Loading and metering device consists of vertically moving, cam-actuated pushers separated by fixed spacers. Parts roll or slide into next higher position.

Operating experience shows that loads varying from 500 to 4000 lb per hr can be delivered to the furnace. Feeding hoppers may be set in a pit, placed at floor level or raised above the floor. Speed of the machine, the number of steps and length of the loader are determined by the rate of loading, type of part, width of the belt and other factors.

The No. 2 furnace loader occupies only 24 sq ft. Installation required only clearing the necessary floor space, building a pit, and installing a power source. All other equipment, including the power train, are integral with the machine. Capacity of the hopper is 1800 lb.

Speed of the loader is determined by the size and shape of the part. A typical rate of operation is 5 strokes per min. This will deliver, for example, 60 to 70 bolts per min to the furnace. The machine loads at a uniform rate of 1 million lb of screw machine parts and assorted small stampings per month.

## Handles many small parts

This loader has replaced hand loading which required two attendants. A single workman keeps the hopper filled and watches the controls.

Maximum dimension of parts being loaded successfully is 5 to 6 in. Typical parts heat treated include nuts, bolts, screw machine parts, washers (see Fig. 3), bushings and small stampings. Pushers on this machine are made of mild steel but later installations will have cyanided pushers to resist wear. The spacer plate will be chilled iron.

The machine has been designed in such a way that the load is always balanced. While one group of pushers is being raised, an equal number is lowered. This design permits smooth operation. Oil from screw machine parts and stampings also helps to resist wear.

Operating experience indicates that some

FIG. 2—Synchronized pushers lift parts from hopper and discharge them in even and regular quantities to heat treating furnace conveyer. Quantities delivered are uniform to within 5 pct on small parts.

Furnace loading machine (continued)

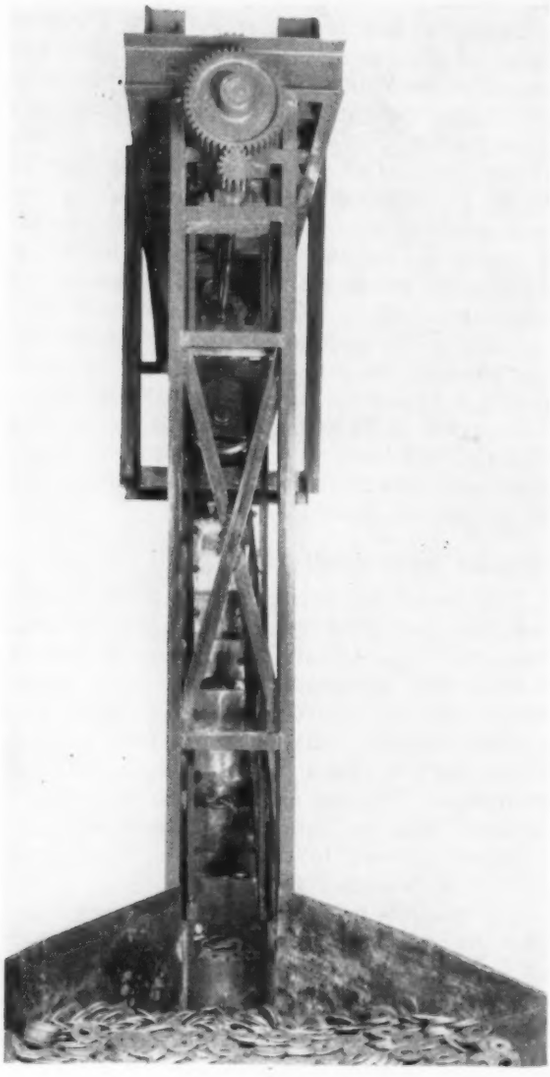


FIG. 3—Washers, small screw machine parts and metal stampings are easily handled by furnace loader. Overhead motor and drive simplify maintenance.

types of stampings may tend to hook onto the steps. This difficulty has been overcome in some instances by speeding up the rate of operation. Thin washers and small springs which tended to jam earlier machines are now being handled successfully.

Several important engineering changes are being made on loaders now under construction. A radical change has been made in the drive, permitting smoother operation. The stroke has been cut in half, stepping up the rate of feed and simultaneously reducing friction. A safety clutch will be installed to minimize possible breakage of the drive. An automatic reversing device will be added, permitting freeing of the machine from any obstruction without requiring, in many instances, the services of an attendant.

Auto manufacturers and leading parts makers have shown considerable interest in the device. A model recently completed permits loading of single parts into a heat treating furnace. The possibility that this machine can be built to meter parts for packaging is being examined. It is also being tested for feeding centerless grinders.

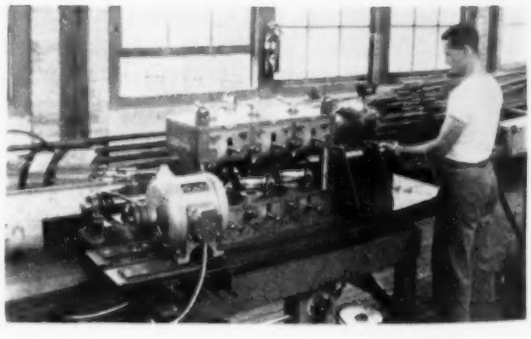
## Rotary straightener helps up tubing production

A recently completed plant expansion project, at Small Tube Products, Inc., Waterbury, Conn., has resulted in a 70 pct increase in production.

The accompanying picture shows the cross-rolled straightener in the finishing department. Operating at the rate of 550 fpm of copper or brass tubing, this machine removes waves and bends from about 1000 pieces of 20-ft tubing per hr.

Tubing straightened on this machine varies in size from ¼ to 1 in.; in wall thickness from 0.010 to 0.083 in., and in length from 6 to 24 ft. Despite these variances and their resultant frequent change in machine setup, the Mackintosh-Hemphill rotary unit enables this plant to meet straightness requirements considerably more rigid than was possible with other straightening equipment.

Of unusual interest is the powered cotton buff seen to the left of the straightener, developed by Small Tube's plant manager. Machine operator applies solvent to tubing to cut the lubricant used in drawing. The solvent, in itself, is a lubricant for tubing as it passes between the rolls. The rotating buff automatically wipes the tube clean and eliminates a manual cleaning of finished product.



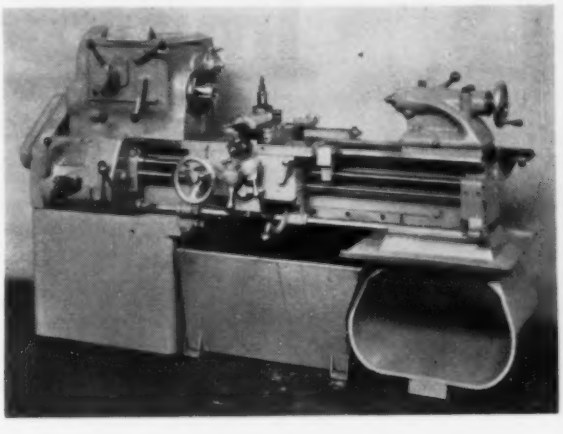
## Welded, shock resistant lathes ordered by Navy

Most naval vessels carry some machine tools for making emergency repairs. In World War II certain cast iron components of machine tools on vessels bombed or rocked by near misses were shattered, not only putting tools out of commission, but creating dangerous hazards to personnel.

This experience has lead to demands for machine tools that are more shock resistant. Springfield Machine Tool Co., Springfield, Ohio, cooperating with design consultants of The Lincoln Electric Co., has answered this demand by producing lathes whose beds and legs are weldments fabricated from steel. Such lathes are not only much more shock resistant, but the steel is both stiffer and stronger and the chance of shattering is nearly eliminated.

In addition, novel forms of leg structures are used and are designed not only to resist shock and the stress of deck weaving, but are so made that shocks are cushioned and largely absorbed before they can reach the bed. Moreover, the bed (upon which the accuracy of lathe work largely depends) is so mounted that leg distortion cannot twist the bed. These lathes weigh about 7 pct less than standard models.

The Navy has placed orders for 14 and 16-in. lathes of the type illustrated and this is expected to have far reaching effects upon future machine-tool purchases for naval use.



## Vibratory press speeds swaging job 800 pct

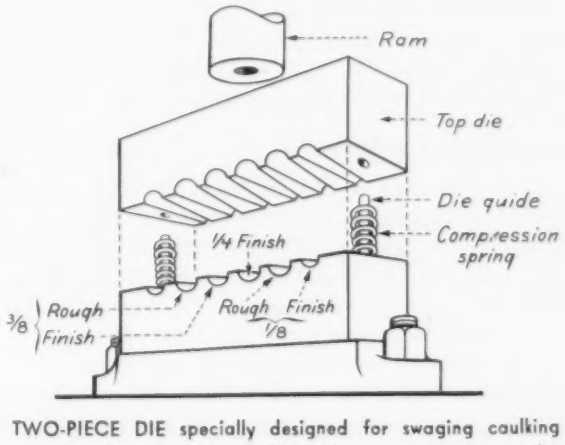
At the Crew Manufacturing Co., Cleveland, an 8-ton oil-hydraulic press with unique tooling is used to swage caulking gun tips from ½-in. steel tube. A highly skilled operator now turns out 1200 of these tips a day, 800 pct faster than the former rate. The hydraulic equipment is a standard Multipress, with special control for vibratory ram action, made by The Denison Engineering Co., Columbus, Ohio.

Not only has production increased sharply with hydraulic pressure, but also quality of the work has so improved that scrap losses are eliminated. An important factor in the efficiency of this tip-swaging operation is said to be vibratory ram action. The press ram delivers multiple strokes of uniform, preset pressure when the operator holds the foot-pedal in lock-down position. These strokes are short and repeated rapidly to almost the effect of vibration.

In this press application, short lengths of ½-in. steel tube are tapered to form caulking gun tips with ⅛-in., ¼-in. or ⅜-in. end opening. Tips in any of the three sizes are produced by using a single two-piece die mounted on the press bed. The center portion of this die has roughing and finishing cavities for each tip size. Compression springs separate the top and bottom die halves, opening them slightly between each vibratory effort of the press ram. Pressure is applied smoothly, without smashing impact, when the ram meets work resistance. As a result, the tips are formed with a continuous flow of metal.

Using inside pliers, the operator holds the short lengths of tube stock, then rotates and feeds them to the desired depth in die cavities of the proper size. He skillfully judges by feel the progress of work in the die.

Production can be switched from one size of caulking gun tip to another simply by choosing the correct die cavities. Downtime for changing dies is completely eliminated. Only one adjustment is necessary. The die is moved to right or left on the press bed to center the work under the ram. This shift is easy to make. There is no direct connection of the die with the press ram.




TWO-PIECE DIE specially designed for swaging caulking gun tips. Die can be shifted to bring proper cavities under ram, depending on tip opening desired.

By Wackch Iwascheff
Consulting Engineer
Braunschweig, Germany

## Special cutting head

# Improves

## deep trepanning

**A study of special techniques and cutter designs for deep trepanning shows this method more economical and reliable than boring or drilling holes in long workpieces.**

Many long workpieces such as gun barrels, propeller shafts, machine tool spindles, and press columns, must be bored through their entire length. For such applications a study has been made of special deep trepanning techniques which are more economical and reliable than ordinary boring procedures.

In boring, all the material in the hole is converted into chips. In trepanning, hollow boring tools leave a solid core. When boring exact and deep holes in solid material, certain difficulties are experienced because of the diameter and length of the bore. These involve such considerations as the length-diameter ratio of the drill, drill helix angle, drill taper, special chip removal provisions, and need to drill hole in steps with drills of increasing diameter to keep hole accurately centered. Usually hole must be rough bored, finish bored and reamed.

### Trepanning Differs

Cutting only a ring-shaped cylinder with a hollow boring tool, leaving a solid core, is a basically different process. Experience has proved that the best cutting conditions are obtained in deep trepanning when the core diameter is 63/100 of the bore diameter.

Deep trepanning requires that the best relationship between cutting speed, feed and width of cut be found. Feeding pressure and elimination of chips are also important factors. The prerequisites for making exact holes include not only a correctly ground tool but also appropriate feeding pressure which will permit favorable tool forces to act at the cutting edge.

The first design of a test boring head for deep trepanning had two tool tips—a grooving and a finishing tool, which machined the width of cut in three chips.

Fig. 1 shows this boring head. A and B are the chip spaces which also continue along the boring bar. The grooving tool is positioned at A and the finishing tool at B. While the workpiece is rotating, the boring bar moves only in the axial direction. The coolant flows through holes in the boring bar to the cutting edges and

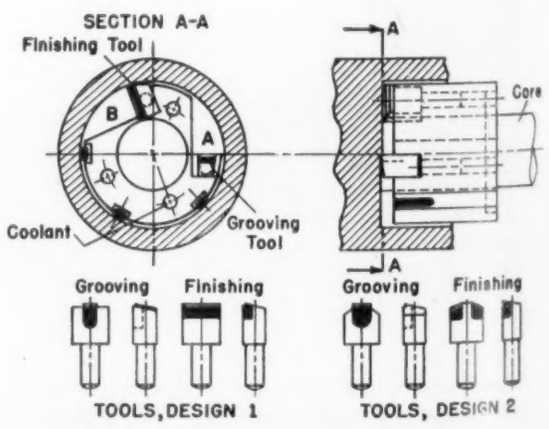



FIG. 1—Head with grooving and finishing tool.

## PERFORMANCE OF CUTTING HEADS

| No. | Fig. No. | Driving Power KW | Boring or Trepanning | Width of Tool Tip, in. | Diam. of Bore, in. | Feed, in/min | Chipping and Wear of Carbide, oz/ft | Cutting Capacity, ft/hr | Grade of Carbide* |
|---|---|---|---|---|---|---|---|---|---|
| 1 | 1 | — | T | 0.865 | 3.58-8.35 | .475 .64 | .84-.85 | 2.61 | $S_1$ |
| 2 | 2 | — | T | 0.865 | 4.75-6.75 | .72 - .96 | .21-.32 | 3.95 | $S_2$ |
| 3 | 2 | — | T | 0.865 | 3.58-8.35 | .96 -1.27 | .1 -.15 | 5.9 | $S_2$ |
| 4 | 3 | — | B | — | 2.38-2.78 | [illegible] | .15-.21 | 29.5-39.5 | $S_2$ |
| 5 | 4 | 40 | T | 0.788 | 3.58 | 4-6 | — | 29 | $S_1$ |
| 6 | 4 | 40 | T | 0.708 | 2.38-2.78 | 6-8 | 0.012 | 39.5 | $S_1$ |
| 7 | 4 | 32 | T | 0.630 | 2.38 | 8-12 | 0.006 | 49.3 | $S_1$ |

*$S_1$ = Carbide suitable for high cutting speeds and feeds.
$S_2$ = Carbide suitable for medium cutting speeds and feeds up to 0.080 ipr and interrupted cuts.

returns through the chip space. The cutting edges are provided with chip breakers to form short chips. However, tests showed that when a coolant was used, clogging of the chip spaces was prevented and chip breakers were unnecessary.

In the boring head just described, two cutting edges work simultaneously. During the cutting operation unequal pressures are exerted upon the tool tips because of differences in the microstructure of the workpiece. Although the narrow grooving tool generally stands up, the broad finishing tool is frequently overloaded, thus causing the sensitive carbide tip to fail. An improved tool tip design, No. 2, was chosen to replace design No. 1. But, this boring head was not very economical because the breakage of carbide material was exceedingly high.

### Cutting Speed Variations Cause Trouble

It is well known that in a twist drill the chisel edge point dulls under the effect of feeding pressure since cutting speed varies from zero at the center to a maximum at the outside diameter and the chisel edge point deviates from the center line. The center of the drill does no real cutting, although the highest thrust value exists at this point. Use of proper relief at the chisel edge point improves this unfavorable condition.

In applications in which the drill is not rotating, the point can be ground off center by about 1/6 of the drill diameter and thus take part in the cutting action. The point then describes a circle through which the detrimental effect of the feeding pressure is minimized.

In deep trepanning, the problem of cutting speed varying with the radial distance from the center of the workpiece is also encountered. If a boring tool is used, there will be a point at the center of the workpiece where the tip is under pressure but does not cut. Trepanning eliminates this condition. And use of a single trepanning bit instead of the two-tool head of Fig. 1 reduces the difference in cutting speeds and improves performance.

The shape of tool tip, Fig. 2, was chosen in such a way that not only was good chip disposal obtained, but runout of the tool was also eliminated. On a boring head guide bars alone cannot prevent runout which is caused directly or indirectly by the shape and angles at the cutting edge. It has not been possible to establish conclusively whether runout is due to unequal cutting pressures along the cutting edge or to the shape of the tool. For example, the two sides "a" in Fig. 2 could influence the center part "c." The trepanning head in Fig. 2 has a diameter of 4.8 in. The cutting speed at the larger diameter at A is about twice the speed at B. These differences are detrimental when boring with carbide tools. The chip thickness depends upon the workpiece material and must be established by tests.

The boring head in Fig. 2 is provided with only one cutting tip. The tip has three cutting edges and functions as a grooving tool, c, and two finishing tools, a. The tool tip is symmetrical. The shape of the tool is ground in such a way that tolerances are referred to the center of the tool tip and not to the center of the workpiece. Runout can be prevented by grinding the tool tip to within 0.0008 in. of symmetry.

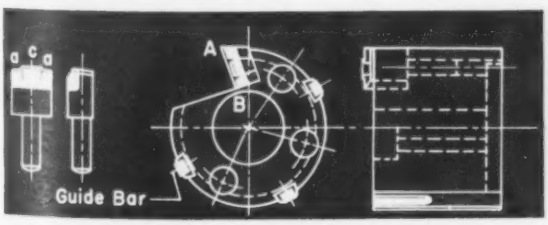



FIG. 2—Head with three tool tips.

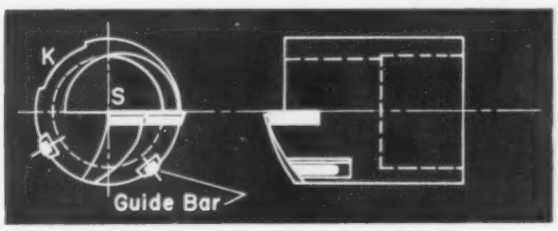



FIG. 3—Boring head with one blade.

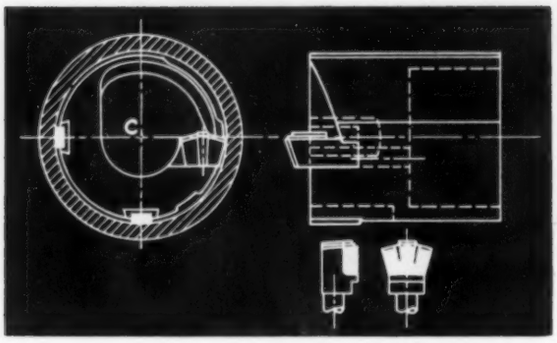


FIG. 4—Improved head with triple-edge tool tip.

## Improved deep trepanning (continued)

The chip space should have the greatest cross-section possible. Adjustable guide bars served the purpose of bringing about a recentering of the boring bar when runout was indicated by an increase in power requirements. The cooling arrangement was the same as before. Wear and breakage of the carbide were too high mainly because there was too great a difference in speed between the points A and B of the tool tip, the feed was too fine, and the tool was used beyond the point at which it should have been reground.

When the feed was increased, thicker chips were formed. This could have caused chip interference had the rate of flow of the coolant and the size of the chip space been kept the same. Although the increase in feed led to formation of shorter chips, rapid wear of the cutting edge was encountered in deeper holes. When the cutting edge was placed about 0.012 to 0.020 in. below center, the desired short chips were formed for the entire depth of the hole. Performance was improved, but was not yet satisfactory.

An efficient boring head for cutting a complete hole, similar to that illustrated in Fig. 3, was developed by G. Heller, Bremen-Mahndorf. Cooling and chip disposal were originally obtained in the same way as previously described. But because of unfavorable performance of the boring head, the cooling and chip disposal of the head for sizes above 0.8 in. were changed as indicated in Fig. 3. The coolant is brought under pressure around the outside of the boring head between the recessed surface K and the walls of the hole, removing the chips through S.

After the available boring heads were tested and only one cutting tip was found to perform well, the boring head of Fig. 3 was redesigned for deep trepanning and provided with the triple edge cutting tip discussed above. The coolant was supplied between the boring head and workpiece to the cutting edge and returned through the central opening carrying the chips to a box where the chip shape was continuously watched. With this design a very good surface finish with no chatter marks was obtained.

### Boring Head Adapted to Trepanning

A comparison of the results of tests on these various heads is given in the accompanying table. The most efficient design is seen to be that of Fig. 4. This design utilizes the single tool tip with three cutting edges, with a narrow tip width to reduce cutting speed differences. The axis of the grooving tool coincides with the axis of the finishing tool. There is no zero-cutting-speed point on the tool. Cutting speed, feed per rev, and width of chip are correctly related. Short broken chips are produced. Power requirements are low. The coolant is supplied around the boring head and returns, with the chips, through the center of the boring bar.

This design is more efficient and economical than a carbide-tipped twist drill. Large-diameter, deep bores with good surface finish and less runout can be made in one pass.

This article was translated by the author for THE IRON AGE from a manuscript prepared for Werkstattstechnik und Maschinenbau, Vol. 40, No. 2, 1950.

# Slag pits cleaned with less handling

SLOW HAND LABOR and frequent relocating of slag ladle was required before this Allis-Chalmers tractor got the job of cleaning out open hearth slag pits. This single tractor services from three to four pits and it works in hot slag almost all the time. It starts cleaning operations as soon as a furnace has been tapped and works right next to the hot ingot molds. This unit also handles loam clay for lining runners, spots cars and has a hook attached for placing machinery and carrying pipe.

# Boron Steels

## a new era in alloy metallurgy

### Part V. Boron cold-headed bolt steels under test . . . Use of 14B20 and 14B18 still in doubt . . . 86B45 proved successful in axle shafts, 81B45 under test.

By D. I. Brown
Technical Editor

Some boron steels have been adopted for cold-headed bolt applications to replace the 4037 grade. The medium carbon 14BXX steels are well established but the utility of 14B20 or 14B18 for carburized parts has yet to be tested. Hundreds of heats of 86B45 have been used as shafts. A leaner alloy 81B45 shows promise in shafts up to 1 9/16 in. diam.

Medium carbon boron steels have been used in large tonnages for bolts, hand tools and other thin section parts for years. Caterpillar Tractor Co. has used many thousands of tons of 14B35 and 14B38 as bolts and heat-treated bar stock. The bar stock is later made into studs and is induction heated and water quenched.

Alloy steel heat-treated bolts and cap screws are an important item. During World War II 66 pct of all fasteners, bolts, nuts, screws and rivets went into defense applications.

Considerable work has been done in alloy conservation on bolts. At Caterpillar Tractor Co., Peoria, Ill., using 14B38, it is their practice to water quench this grade in sizes larger than ⅞ in. diam. Sizes under ½ in. diam. are oil quenched and a minimum Rc 45 is obtained at the center as quenched. On the intermediate size from ½ to ⅞ in., a plain carbon 1038 steel is used and is water quenched.

AISI has just announced the three 14BXX steels shown in Table XV as standard carbon boron steels. The 14B35 series is used for cold-headed bolts and the 14B50 grade has been used for years in hand tools.

The thousands of tons of 14B50 used by Sierra Drawn Steel Co. (for published references see Part I, THE IRON AGE, July 5, 1951) are proof of the utility of this carbon boron grade. Better die life on the forging press, easier scale removal and better cold heading of the 14B50 steels over previous alloy grades are well established.

However, there is a serious question of how

TABLE XV

AISI 14BXX SERIES

| Grade | C | Mn | P (max) | S (max) | S | B (min) |
|---|---|---|---|---|---|---|
| 14B35 | 0.33 to 0.40 | 0.70 to 1.00 | 0.04 | 0.04 | 0.20 to 0.35 | 0.0005 |
| 14B50 | 0.47 to 0.55 | 0.70 to 1.00 | 0.04 | 0.04 | 0.20 to 0.35 | 0.0005 |
| 14B52 | 0.47 to 0.55 | 1.20 to 1.55 | 0.04 | 0.04 | 0.20 to 0.35 | 0.0005 |

well the 14BXX series will work as carburizing grades. A few heats have been melted and are under test. The Jominy curve of the 14B20 heat melted by Timken Roller Bearing Co. is shown in Fig. 28. This chemistry is a little higher in residual alloy than would be expected in some shops. It, therefore, has more hardenability than would be had from other 14B20 heats and herein lies the major drawback to this grade.

The hardenability of a commercial heat of 14B18 is shown in Fig. 29. The residual alloy in this heat is possibly more representative of what could be expected in most carbon steel shops today. The lower curve "A" is the result of an end quenched test on a 1¼ in. round which was packed carburized at 1680°F and the carburized case removed before running the regular and quench hardness readings. The case depth ran from 0.047 in. to 0.059 in. The top set of curves in Fig. 29 are results on finish machined specimens pack carburized at 1680°F which, after hardening, were ground to the various diameters shown.

### Residual alloys a big problem

Residual alloys in carbon steels are always a problem in wartime as this alloy content is picked up from the scrap charged into the furnaces. The variation in residual alloy content does not appear to affect the spread in hardenability of medium carbon grades as much as it does in lower carbon grades. Because different mills experience different alloy residuals, the hardenability spread of the 14B20 series will probably be wider than any other steel type. This is no fault of boron and can ably be controlled by very rigid scrap separation. Whether or not industry will be able to use a steel of the wide variation in hardenability that 14B20 series will probably have remains to be seen.

It is believed that a minimum of 1.00 Mn is needed in the 14BXX carburizing series if the steels are to be practical alternates for low alloy steels. Some believe a minimum of 0.25 Cr content may still be needed in a 14BXX carburizing steel to insure consistent hardenability to satisfactorily replace other alloys in carburized applications.

In Table XVI are the carburizing results of tests on a single induction 14B20 steel. The analysis of this steel plus the end quench hardenability are shown in Table XVII and Fig. 30, respectively. The curves are superimposed on the 8620 H band for comparison. The conclusions of this test run at Duquesne Works of U. S. Steel Co. were that there was no appreciable difference in carburizing characteristics between the induction 14B20 heat and the 8620 openhearth heat when box carburized at 8, 12 and 16 hr.

TABLE XVI

CARBURIZED 14B20 v. 8620

| Grade | Carburizing Time, hr | Depth of Hypereutectoid Zone, in. | Depth of Carbon Penetration from Edge to Normal Structure, in. | Rate of Carburizing through Eutectoid Zone, ipm |
|---|---|---|---|---|
| 14B20 | 8 | 0 024 | 0 071 | 0.0052 |
| | 12 | 0 031 | 0 097 | 0.0043 |
| | 16 | 0.041 | 0 110 | 0.0038 |
| 8620 | 8 | 0 020 | 0 071 | 0.0049 |
| | 12 | 0 030 | 0 090 | 0.0044 |
| | 16 | 0 037 | 0 101 | 0.0036 |

Grain Size and Hardness
Brine Quenched from 1700° F

| Grade | Fracture Grain Size (Shephard) | McQuaid Ehn | Rc Hardness |
|---|---|---|---|
| 14B20 | 6¾ | 7 to 8 | 23 |
| 8620 | 6¾ | 7 to 8 | 24 |

It should be emphasized that 14B20 has yet to be tested in any part and any conclusions as to the applicability of this grade as an alternate to any alloy grade would be most premature at this time.

Certain other bolt applications using new boron steels have been tested and have in most cases worked well. Table XVIII shows a list of alternate steels recently announced as standard

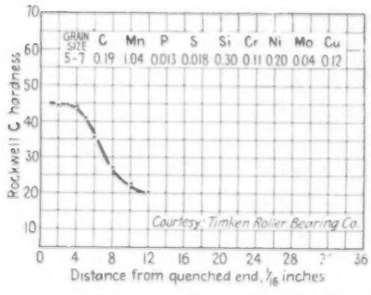

GRAIN SIZE C Mn P S Si Cr Ni Mo Cu
5-7 0.19 1.04 0.013 0.018 0.30 0.11 0.20 0.04 0.12
Rockwell C hardness
Courtesy: Timken Roller Bearing Co.
Distance from quenched end, 1/16 inches

FIG. 28—Hardenability of first 14B20 production heat.

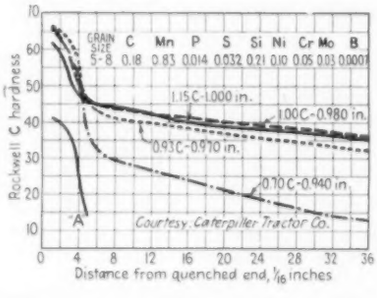

GRAIN SIZE C Mn P S Si Ni Cr Mo B
5-8 0.18 0.83 0.014 0.032 0.21 0.10 0.05 0.03 0.0001
1.15C-1.000 in.
1.00C-0.980 in.
0.93C-0.910 in.
0.70C-0.940 in.
A
Courtesy: Caterpillar Tractor Co.
Rockwell C hardness
Distance from quenched end, 1/16 inches

FIG. 29—Hardenability of first 14B18 production heat.

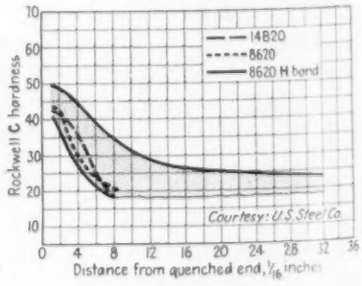



FIG. 30—Hardenability of induction heat of 14B20 compared to regular heat of 8620, both of which are plotted against standard H band of 8620H.

TABLE XVII

## CHEMICAL ANALYSIS 14B20 v. 8620

| Grade | | C | Mn | P | S | Si | Ni | Cr | Mo | Ti | B |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 14B20 | Range | 0.18 to 0.23 | 1.30 to 1.60 | 0.04 | 0.04 | 0.20 to 0.35 | ..... | ..... | ..... | ..... | 0.001 min |
| | Actual | 0.20 | 1.39 | 0.012 | 0.020 | 0.27 | ..... | ..... | ..... | 0.003 | 0.0008 soluble<br>0.0012 insoluble |
| 8620 | Range | 0.18 to 0.23 | 0.70 to 0.90 | 0.04 max | 0.04 max | 0.20 to 0.35 | 0.40 to 0.70 | 0.40 to 0.60 | 0.15 to 0.25 | ..... | ..... |
| | Actual | 0.21 | 0.73 | low | low | 0.29 | 0.55 | 0.49 | 0.21 | ..... | ..... |

AISI grades for bolts and bolt wire, five of which are boron steels.

Good bolt wire has to have more than just equivalent hardenability to the former grade. Usually an excellent surface free from seams, particularly on cold headed bolts, plus good formability are essential. The most popular alloy cold heading bolt grade for small sections in recent years has been 4037.

Connecting rod bolts have been made of other steels but 4037 steel is generally accepted as the standard grade. However, it appears that 4037 will be used for aircraft only and that all other connecting rod bolts will be downgraded.

Bolts of the Place Head self-locking type are used on many tanks and military vehicles. This bolt has an under-cut washer face and is one of the toughest bolts to make. The 14B38 steel was tried out at one plant instead of the standard 4037 steel but results showed that it doesn't head as well. The 14B38 grade, when water quenched and drawn at 1000°F, tested Rc 29 to 31 in the center. It is believed this grade will be satisfactory for sizes up to ½ in. diam in the as-quenched condition, and judging from Caterpillar's experience, 14B38 can be used.

So far tests show that water-quenched 40B37 and 14B37 bolts can be drawn at temperatures up to 1200F. Many hundreds of tons of these boron bolt steels are in service and no poor performance has been experienced.

One of the most encouraging recent results on carbon boron steels has been 14B45. Helical compression springs of this grade water quenched have shown better fatigue life than the same springs made of 8660 oil quenched.

Five heats of 14B35 have been used for springs by American Steel Foundries with success. They report fully quenched out structures in sections up to 19/32 in. thick with either oil or water quenching. Sizes up to 1⅛ in thick when water quenched show equally good results. Comparison of the 14B45 properties with the

TABLE XVIII

## AISI ALTERNATE BOLT STEELS

Sizes to ½ in. diam, Inclusive

| Grade | C | Mn | Ni | Cr | Mo |
|---|---|---|---|---|---|
| 40B37 Modified | 0.34 to 0.42 | 0.70 to 1.00 | ..... | ..... | 0.08 to 0.15 |
| 8035 | 0.32 to 0.39 | 0.70 to 1.00 | 0.20 to 0.40 | 0.15 to 0.35 | 0.08 to 0.15 |
| TS8135 | 0.33 to 0.38 | 0.70 to 0.90 | 0.20 to 0.40 | 0.30 to 0.50 | 0.08 to 0.15 |
| 14B35 | 0.33 to 0.40 | 0.70 to 1.00 | ..... | ..... | ..... |
| 5035 | 0.33 to 0.40 | 0.70 to 1.00 | ..... | 0.20 to 0.40 | ..... |

Sizes over ¼ to ¾ in. diam, inclusive

| Grade | C | Mn | Ni | Cr | Mo |
|---|---|---|---|---|---|
| 40B37* | 0.34 to 0.42 | 0.70 to 1.00 | ..... | ..... | 0.20 to 0.30 |
| 80B37 | 0.34 to 0.42 | 0.70 to 1.00 | 0.20 to 0.40 | 0.15 to 0.35 | 0.08 to 0.15 |
| TS8137 | 0.35 to 0.40 | 0.70 to 0.90 | 0.20 to 0.40 | 0.30 to 0.50 | 0.08 to 0.15 |
| 50B37 | 0.34 to 0.42 | 0.70 to 1.00 | ..... | 0.20 to 0.40 | ..... |

* For aircraft applications.

Note 1. The boron steels, namely 40B37 Modified, 14B35, 40B37, 80B37, and 50B37 can be expected to have 0.0005 pct min. boron content.

Note 2. The phosphorus and sulfur limitations for each steelmaking process are as follows:

| | |
|---|---|
| Basic electric furnace | —0 025 max pct |
| Basic openhearth furnace | —0 04 max pct |

Note 3. The silicon range for the foregoing grades is 0.20 to 0.35 pct.

Note 4. Small quantities of certain elements are present in alloy steels which are not specified or required. These elements are considered as incidental and may be present to the following maximum amounts: Copper, 0.35 pct; Nickel 0.25 pct; Chromium 0.20 pct; and Molybdenum 0.06 pct.

TABLE XIX

## BORON SPRING STEEL

| Range of Base Analysis— | C | Mn | Si | Cr | Ni | Mo |
|---|---|---|---|---|---|---|
| 14B45 | 0.45 to 0.49 | 0.68 to 1.15 | 0.22 to 0.28 | 0.03 to 0.13 | | |

Special treatment — Grainal No. 79

| Hardenability— Distance in Sixteenths | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 16 | 24 | J-50 distance |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Range of Rc — | 57 | 57 | 55 | 41 | 30 | 29 | 28 | 27 | 23 | 16 | 3¼ to 8½ Sixteenths |
| | 59 | 58 | 57 | 56 | 56 | 53 | 45 | 33 | 26 | 21 | |

Physical properties — (Sections up to 19/32 in. diam—oil quenched and tempered)
(Sections up to 1⅛ in. diam—water quenched and tempered)

| | |
|---|---|
| As-rolled hardness | — 183 to 248 Bhn |
| As-quenched hardness (1550° F) | — 57 to 60 Rc |
| Microstructure—surface | — Martensite |
| Microstructure—center | — 90 pct martensite minimum |
| Decarburization | — 0.003 to 0.020 in. |

| Spring Steel Grades | 14B45 | 8650-H<br>8660-H | 14B45 | 8650-H<br>8660-H |
|---|---|---|---|---|
| Tempering temp., °F | 550 | 600 | 750 | 850 |
| Tensile strength, 1000 psi | 241 to 265 | 251 | 200 to 202 | 211 |
| Yield strength, 1000 psi (0.2 pct offset) | 213 to 233 | 217 | 186 to 187 | 190 |
| Elongation, pct | 11 to 13.5 | 9.5 | 14.5 to 16 | 13 |
| Red. area, pct | 41 to 53 | 28 | 53 to 58 | 42.5 |
| Single width V-notch Charpy, ft-lb | | | | |
| Room | 16 to 26 | 12 | 25 to 32 | 19 |
| —40°F. | 15 to 26 | 9.5 | 18 to 23 | 16.5 |

Boron steels (continued)

former alloy spring steels used are shown in Table XIX.

A limited number of fatigue tests have been made on 14B45 steels. They have consisted of Rayflex type reversed bending tests on heat-treated bars with hot-rolled surface. This same test has also been run on hot wound springs. Average results on reversed bending show that 14B45 has a fatigue life of about 200,000 cycles compared to 125,000 cycles for the 8600-H steels at a stress level of 60,000 psi. A limited number of fatigue tests have been run on flat bars of 14B45. Results show that these samples were inferior to the fatigue life of the 8600H grade.

One of the most popularly used medium carbon alloy boron steels has been 86B45. Many heats of this grade have been used at Caterpillar Tractor Co. for highly stressed axle shafts, spindles and similar parts from 3 to 6 in. diam. Some of these parts are illustrated in Fig. 31. These parts vary from 28 in. to 38 in. in length.

The axles are oil quenched and drawn to 269 to 302 surface Bhn. These parts are heat treated as rough forgings and later machined. In producing other types of shafts, Caterpillar usually oil quenches and draws the machine part to Rc 42 to 50 on the surface and then grinds the parts to finish size.

The 86B45 shows less tendency to crack in heat treating than did the 4340 grade formerly used. Also the boron steel at this carbon level distorts less than did the 4340 parts. Another decided advantage of 86B45 is that it can be annealed much faster than the former grade.

For best overall machinability, Caterpillar has worked out a prior treatment in a specially designed controlled atmosphere continuous annealing furnace. This 2-cycle anneal is shown in Table XX. A typical annealed microstructure resulting from this practice is shown in Fig. 32.

Laboratory machinability tests show an improvement in overall machinability of about 25 pct for 86B45 compared to the old annealing practice of heating to 1600°F followed by slow furnace cooling. In Fig. 33, photographs of the machined surface of samples given the two different anneals are compared.

In Fig. 34 the hardenability experienced at Caterpillar on 162 full heats of 86B45 are plotted. This is not a standard H band for the grade but merely the full range of hardenabilities of all these heats.

Because of the continuing alloy shortage even 86B45 may turn out to be too rich an alloy for civilian application. There have been some tests on 81B45 which could be used on axle applications similar to those at Caterpillar. These tests run at Eaton Mfg. Co., Axle Div., Cleveland, compared the torsional properties of 81B45 shafts to shafts made from the regular 4100H and 4300H steels.

These shafts were 1 9/16 in. diam, weighed 26½ lb and were oil quenched from 1550°F and tempered at 875°F. The Brinell requirement for 4340H on this part is 388 to 444 Bhn and these hardnesses, as well as the mechanical properties, are shown in Table XXI. As a result of this test, it was concluded that up to 20 sixteenths on the hardenability curves of this particular heat of 81B45, Fig. 35, was within the band of 4340H. Also that the torsional yield and ultimate strengths of 81B45 are close enough to the regu-

Axle Shafts

King Bolts

FIG. 31—Photographs from Caterpillar Tractor Co. of some of the parts made from 86B45.

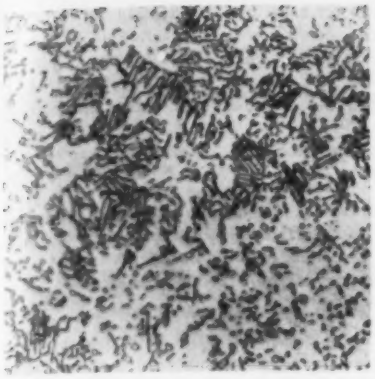


FIG. 32—Typical microstructure of 86B45 after continuous cycle anneal, 4 pct picral etch. 1500X

TABLE XX

**CONTINUOUS CYCLE ANNEAL FOR 86B45**

1. Heat to 1600° F.
2. Cool to less than 800° F. (Accelerated controlled atmosphere)
3. Heat to 1380° F.
4. Cool to 1210° F. (Accelerated controlled atmosphere)
5. Hold at 1210° F. for three hours.
6. Cool to less than 600° F.
7. Discharge.

TABLE XXI

**4340 v. 81B45 AXLES**
**Torsion Test Results**

| Type Steel | Yield Strength, psi | Ultimate Strength, psi | Twist, deg. | Brinell Hardness | | |
|---|---|---|---|---|---|---|
| | | | | Surface | ½ Rad. | Center |
| (1) 81B45 | 106,000 | 141,600 | 513 | 388 | 388 | 388 |
| (2) 81B45 | 109,000 | 144,000 | 477 | 375 | 388 | 388 |
| 4340H | 118,500 | 153,000 | 1050 | 415 | 401 | 388 |
| 4147H | 108,400 | 160,400 | 557 | 415 | ... | ... |

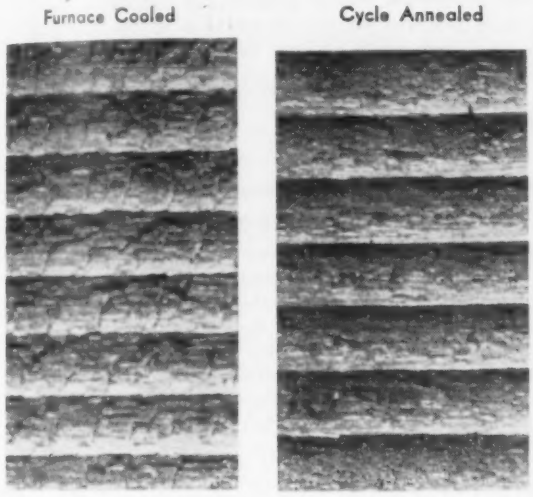



FIG. 33—Comparison of machined surfaces of 86B45 after regular and continuous cycle anneal. Surface from old practice on the left, typical surface of new annealing practice is shown at the right.

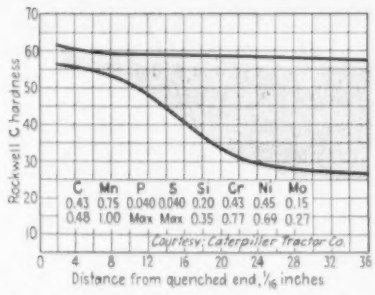

Rockwell C hardness
C Mn P S Si Cr Ni Mo
0.43 0.75 0.040 0.040 0.20 0.43 0.45 0.15
0.48 1.00 Max Max 0.35 0.77 0.69 0.27
Courtesy: Caterpillar Tractor Co.
Distance from quenched end, 1/16 inches

FIG. 34—Hardenability range of 162 production heats of 86B45. This is not a standard H band.

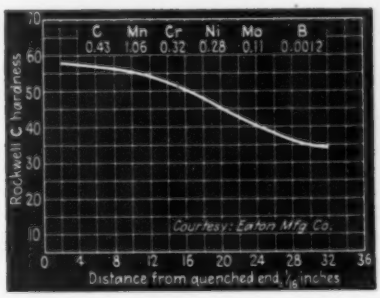



FIG. 35—End quench hardenability curve of one heat of 81B45 tested as axles at Eaton Mfg. Co.

lar materials so that the new grade may be considered a satisfactory alternate. Inasmuch as 86B45 replaced 4340 at Caterpillar, it appears that 81B45, lower in alloy content, may permit going a step further in alloy conservation in certain sized parts.

## Boron Discussion—the experts disagree

There has been exception taken to some statements which have appeared in this series of articles. So far the only objection raised concerned the box "Boron Steel Limitations" in Part I. One of the chief objections has been that, if the readers just read the box and don't read the text, they will come to erroneous conclusions concerning the seven points. This is undoubtedly true, but we expect most readers to read the text which explains and qualifies most of the controversial seven points.

In the hope of dispelling any fears that we have inadvertently created by taking the precautions of showing limitations, one of the objec-

tions voiced is presented here. Another was published on p. 20 of the Aug. 2 issue.

Dear Mr. Brown:

"For some time I have been planning to write you and tell you that you have done a very excellent job in writing up the boron steels in Part I of your Iron Age series. The work is well organized and presented. Articles such as these, if they are read carefully, will do a great deal to illustrate the usefulness of the boron steels. We do not, however, agree with your idea of emphasizing the limitations shown in Part I. Some of them, while true, are not of great enough importance to be highlighted. I have discussed the statement of the boron steel limitations with several other metallurgists and find that none of us agree with you in this respect. However, others probably do.

*1. More boron needed for low carbon grades: True. Possibly 6 lb per ton instead of 4 lb per ton of the addition agent. This is of trivial importance and should not be mentioned.*

*2. Too much boron makes steel brittle: True. Increasing carbon or manganese by 2½ times will also make steel brittle. There is no excuse for any steelmaker putting in 2½ times the specified amount of any element. This is not a valid objection to boron.*

*3. Effect of boron nil at or above 0.90 C: This seems to be true. However, boron does increase hardenability at about 0.75 C or less.*

*4. Maximum benefits of boron only obtained on fully quenched and drawn parts: True. It is also true that the maximum benefits of any alloy are only obtained when parts are fully martensitic before tempering. However, there are very few commercial parts which show complete martensite before tempering. Some metallurgists believe it is only necessary to have 90 pct martensite at the ¾ radius on most parts that are subject to bending and torsion.*

*5. Refers to the fact that boron may not give high impact strength in the core. This statement is true but probably causes needless fears. It should be emphasized that we are not talking about withstanding impacts in service, but are talking about notch sensitivity in the center of a heat-treated piece of a heavy section. Aside from AP shot and armor plate, we know of no other examples calling for high notch sensitivity in the center of large sections. Most metallurgists in the automotive and tractor industries do not consider it necessary to employ impact tests on specifications. Those who use them have carefully established reasonable minimums.*

*6. We do not know any justification for the statement that more precise control of heat treating is required for boron steels. This probably means that the boron steels have a wider spread in the hardenability than other steels. The mill records we have seen to date indicate no wider spread for boron steels than other alloys. It may be true that different heat treatments are needed, but we do not believe it is true that closer control is required.*

*7. The statement that more distortion is likely in heat treating boron steel parts should be qualified to say that more distortion of carburized and hardened boron steels has been reported, but probably will be overcome by the use of a lower carbon steel.*

I wish to say again that you have demonstrated a great ability in writing technical material, and we certainly hope that you will continue to write up the boron steels. You can be of great assistance to us in promulgating the information developed by the boron division. We believe it would be well, however, to present both sides of debatable questions. I hope that you will not be offended at the criticisms we have offered, which we hope are constructive."

*H. B. KNOWLTON*
*Supervisor of Materials Engineering*
*International Harvester Co.*
*Chicago*

**PREVIOUS PARTS OF THIS SERIES**

Part. I. Background of boron steels . . . Recommended alternates for standard grades . . . Advantages and limitations of the new steels—The Iron Age, July 5, p. 79.

Part II. 43B10 and 43B17 replace 3310 and 9310 . . . Boron steels better in wear and fatigue tests . . . Hardenability of alternates fall off faster after 8 sixteenths on Jominy bar than did former steels—The Iron Age, July 12, p. 85.

Part III. Boron carburizing grades in heavy use . . . Show better fatigue and wear life than former grades . . . Carburizing grades distort more in heat treating—The Iron Age, July 19, p. 102.

Part. IV. 50B20 works well for carburized gears . . . Using 50B40 for bolts and 50B47 for axles . . . 50B60 spring steel is here to stay—The Iron Age, July 26, p. 63.

The five parts of this series will be reprinted in a 32-page booklet which will be available by Sept. 1st. Price will be 50c per copy. Quantity prices will be furnished on application.

# Oil impregnated bearing standards released

Two new standards specifying green strength and dimensions and tolerance of oil impregnated metal powder bearings have been released by the Metal Powder Assn.

Self-lubricating bearings made from sintered metal powders and impregnated with oil have gained wide acceptance. MPA standard 14-51T specifies dimensions and tolerances for bearings of the bronze base and iron base type. Identifying designations have been also applied.

This standard should help eliminate the problem of too many bearing sizes, reduced overhead, and conserve metals by cutting inventories and stocks of odd-sized bearings maintained by manufacturers and consumers.

The standard, tentative for 3 years, specifies bore, wall thickness, interference, running clearances, press fits, material compositions and permissible loads for ID and OD. The list of bearings begins with ⅛ in. ID x 3/16 in. OD x ¼ in. length and concludes with 3 in. ID x 3½ in. OD x 4 in. length.

Standard 15-51T deals with green strength, a property peculiar to the powder metallurgy process. The term "green strength" applies to the resistance of a pressed compact to abrasion, breakage and spalling due to rough handling and to the forces resulting from the plastic deformation of dies and relative die segment movement during the pressing operation.

# news of industry

## STEEL'S EARNINGS—Lag Behind Peak Production

**During first half, steel firms made, sold, shipped more than ever before . . . But earnings skidded 30 pct below same period year ago . . . Fear costs, gray market**—*By Bill Packard.*

Earnings of steel companies are lagging far off the alltime record pace of capacity, production and sales. Higher costs, largely taxes, are to blame. But steel leaders aren't singing the blues; their earnings during the second quarter of this year look very good compared with any other period except the record shattering second quarter of last year.

**Make More, Earn Less**—Second quarter earnings of the nation's ten top steel producers (rated on capacity) rose 8.6 pct above first quarter profits. But their earnings for the first half of 1951 are 30 pct less than they were during the first half of last year.

Dollar-wise these financial results are still excellent. Yet they are based on a terrific volume of business. Production and shipments during the first half of this year topped last year's alltime records by about 11 pct. At the same time Federal income taxes are more than 100 pct higher. This points up a problem already of grave concern to some steel executives: Taxes and other rising costs are rapidly narrowing profit margins.

**Margin Shrinks**—U. S. Steel, which accounts for about a third of the industry, reported income for the first 6 months of this year was 6.2 pct of sales compared to 8.6 pct for the first half of last year. This amounts to about a 28 pct slash in the profit margin.

You can mark it in your little black book that any steel wage increase toward the end of this year will be reflected in higher steel prices. That has been the thinking and policy of top steel executives for a long time, and they aren't apt to have a change of mind.

**The Future**—The outlook is for a continuation of capacity operations through the foreseeable future—at least into 1952. Direct military uses are now scheduling about 10 to 13 pct of steel output. But the Controlled Materials Plan is channeling distribution of almost all the steel made. And Administrator Fleischmann indicates that formal announcement of total control over steel distribution may soon be made.

Most steel leaders think controls have already gone too far, in view of the relatively small percentage of total output needed for direct military uses.

**Grace Sounds Warning**—Eugene Grace, Bethlehem's chairman, said: "I don't believe there's any need for controlling all steel production . . . Some of our customers are asking for twice as much as their historic use or need . . . And some of the places we are getting orders from—we never sold them a ton before."

Mr. Grace also declared that if steel users were given all the steel they asked some of them would be greatly overstocked by the end of the year. He warned that great care should be used in certifying allotments—lest unused steel find its way into the gray market.

**Olds Cites Costs**—U. S. Steel's Chairman, Irving Olds is not so critical of CMP. He says "If we

### Steel Company Earnings

| Company | Second Quarter '51 | First Quarter '51 | First Half '51 | First Half '50 |
|---|---|---|---|---|
| U. S. Steel | $58,133,716 | $48,663,781 | $106,797,497 | $119,079,238 |
| Bethlehem Steel | 23,628,770 | 25,066,205 | 48,694,975 | 57,240,573 |
| Republic Steel | 14,458,116 | 12,271,377 | 26,729,493 | 37,702,076 |
| Jones & Laughlin | 8,879,000 | 8,255,000 | 17,134,000 | 16,315,000 |
| National Steel | 14,037,826 | 13,255,401 | 27,293,227 | 29,048,806 |
| Armco Steel | 10,201,463 | 10,443,240 | 20,644,703 | 25,705,771 |
| Youngstown S & T | 9,094,602 | 8,580,142 | 17,674,744 | 18,276,773 |
| Inland Steel | 9,909,828 | 9,318,270 | 19,228,098 | 18,228,466 |
| Wheeling Steel | 4,753,953 | 5,043,744 | 9,797,697 | 7,455,145 |
| Colorado Fuel & Iron | 2,998,508 | 2,805,388 | 5,803,896 | 3,814,498 |
| Sharon Steel | 2,803,953 | 2,248,991 | 5,052,944 | 3,847,837 |
| Crucible Steel | 2,740,400 | 2,554,568 | 5,294,968 | 2,064,076 |
| Pittsburgh Steel | 1,880,029 | 2,131,144 | 4,011,173 | 2,272,843 |
| Barium Steel | 1,259,614 | 1,875,509 | 3,135,123 | 87,999 |
| Allegheny Ludlum | 2,923,590 | 3,303,691 | 6,227,281 | 4,571,171 |
| Detroit Steel Corp. | 3,505,799 | 3,316,567 | 6,822,366 | 3,207,091 |
| Cranite City Steel | 1,607,721 | 1,431,385 | 3,039,106 | 2,873,552 |
| Alan Wood Steel | 617,221 | 776,576 | 1,393,797 | 1,000,459 |
| Continental Steel | 570,428 | 478,405 | 1,048,833 | 1,710,790 |

knew definitely the quantity needed for the defense program—then knew we had a certain balance left over for general distribution—then the steel industry could do a better job (of distribution) than anyone. But, with conditions as they are, this (CMP) may be the best way."

Mr. Olds reported that steelmaking costs are still rising. In addition to taxes, he cited coal, transportation and other goods and services, costs of which are reflecting higher wages. "If our costs go up there isn't any reason why prices shouldn't keep pace," he declared.

## Asks DPA to Approve Harvey Machine Co. Aluminum Plants Loan

Interior Dept. has recommended that Defense Production Administration give the nod to a $46 million government loan to the Harvey Machine Co. for construction of aluminum facilities in Montana and Washington.

Proposed loan would be used to build a 3-potline, 54,000-ton-capacity aluminum reduction plant at Kalispell, Mont., at a cost of about $34 million, and a $12 million alumina plant near Everett, Wash.

Harvey would be required, under the loan, to put up $3,500,000 and to offer another $3,500,000 worth of stock to some 1500 independent aluminum fabricators. These stockholders would have first call on the 54,000 annual tons of aluminum output at Kalispell.

## Dunn Steel, Townsend Merge

The merger of Dunn Steel Products Co., Plymouth, Mich., with Townsend Co., New Brighton, Pa., became effective Aug. 1, following approval by stockholders.

George H. Haarbauer was named general manager of Dunn Steel Products Div. of Townsend Co., succeeding A. C. Dunn, founder and former president of the company, who has retired but is continuing in an advisory capacity.

# TITANIUM—Washington Urges Quantity Output

**Metal may have some uses on jet engines to replace scarce steel alloys . . . Titanium Metals, DuPont may produce 10 tons per day . . . Jet engine builders stretch alloy supplies.**

Quantity output of titanium for some applications on jet engines instead of steels containing critical nickel, cobalt, columbium may stem from signing of letters of intent by two manufacturers to establish plants able to produce the lighter-than-steel metal at a rate of 10 tons per day.

Titanium Metals Corp. of America and DuPont have been encouraged by Defense Minerals Administration to undertake quantity output of the corrosion-resistant metal. Application of titanium in manufacture of jet engines is considered feasible by a number of research scientists, who are concerned about scarcity of alloys.

Titanium ores widely-scattered across the United States are sufficient to last for many generations. Deterrent to mass output of the metal, heavier than aluminum, lighter and as strong as steel, has been development of an inexpensive, mass output refining process. That is a storm center of research right now.

**War Springboard**—Military demand has done much to foster research because many valuable properties of the metal have put it on the must-have list in spite of its high cost. Were it not for this demand, titanium production may not have risen so high.

Long-term success of titanium in a normal market hinges on success of research on refining. Even now some applications as "crucial" parts in general industry are economically feasible because titanium's valuable properties outbalance cost. Metallurgists look either for a new concept of recovery from ores or a sharp adjustment in present procedure to make titanium fit into the peacetime market.

It has been said that producers who finish stainless steels can make a quick switch to working titanium because of its similarity under rollers, etc. Naturally the Air Force has shown a lively interest in titanium alloys. It wants sheets and tubings for its warplanes. But these products also can prove sound for commercial aviation, increasing payloads of planes.

Army men envisage use of titanium alloys for gun mounts, even equipment to be dropped by parachute. It's strong and light and seems a positive means of increasing fire power by being able to cart more weapons.

**"Wonder Metal"** — Washington planners have been impressed by the rapidly growing "wonder metal" legend—which metallurgists will realistically modify. But planners still don't have a clear picture of what scarce metals titanium can replace and to what extent.

The government represented by

### TITANIUM—3600 Tons a Year

**Titanium production last year was 60 tons. This year it will be about 500 tons. By the end of 1952, Titanium Metals Corp. of America's plant at Henderson, Nev., will be producing 3600 tons of the metal a year. The plant, which will employ 1000 productive workers, is to be housed in the Basic Magnesium, Inc., wartime plant. A certificate of necessity covering 85 pct of the $14 million cost has been obtained.**

**Ore will be processed by the thermal-chemical batch process that the company has been using and 151 million kw hr of electrical power has already been allocated from nearby government hydroelectric facilities.**

he Bureau of Mines and the Office f Naval Research has taken part n research and encouraged it. But the toughest nut is admittedly ndustry's to crack: mass production at reasonable cost.

Meanwhile, jet engine builders re stretching their supplies and owering use of scarce metals. Pratt & Whitney division of United Aircraft, for example, has reported it is producing its J-48 et exclusively from Western Hemisphere materials. That covers a lot of ground but in event f war-sliced supply lines America ould still be capable of making et powerplants.

## Building's Up—But Going Down

Construction activity in July as up 3 pct over the June, 1951 nd the July, 1950 figures but ighter restrictions over building re slowing the rate of gain.

U. S. Commerce and Labor Dept. fficials report an absence of the sual seasonal increase in private omebuilding activity. Commercial building has begun to drop, nd there is a continued decline n construction of social and recreational facilities.

## Shipyard Employment Boom

Shipyard employment has increased 60 pct since the start of he Korean war, U. S. Labor Dept. reports. May employment totaled 216,900 workers.

About 40,000 additional workers ill be needed by mid-1952, the overnment believes. No general hortage of shipyard workers exists at the present time, although ocal shortages can be found in ome individual occupations.

## Manufacturing Draws in Workers

Government employment agencies found jobs for more than 14,000,000 workers in fiscal 1951, Bureau of Employment Security reports.

Job placements in manufacturing and other nonagricultural industries increased by 37 pct ver the previous year, while gricultural appointments dropped slightly.

# SKYSCRAPER—Creates Its Own Ideal Climate

**Pittsburgh's U. S. Steel-Mellon Bank building has ingenious "model" to control climate . . . Staggered migration of workers ends in December . . . U. S. Steel has 30 floors**—*By John Delaney.*

Patterns of sun and shadow shifting on a sheet of aluminum, then reacting on thermostats will control the air conditioned special climate of the 41-story U. S. Steel-Mellon National Bank skyscraper recently thrust up in the Pittsburgh business district.

The unique aluminum sheet "model" of the building is set on the roof. It is basically a 24-in. square platform topped with a small sheet of aluminum that is fitted to shade thermostats exactly as if they were attached to the building itself. (This could not be done because of severe columnar lines.) The "model" duplicates light and shadow conditions on the massive structure below. It guides four to six master thermostats in resetting of interior thermostats as the sun warms things up.

SKYLINE SIGHT: New Pittsburgh giant.

Clerks in offices across the street may be soggy with the heat but 525 William Penn Place, official name of the building and the largest in Pittsburgh to be fully air conditioned, will have a climate all its own for the nearly 5000 workers soon to be its tenants.

**Staggered Migration** — U. S. Steel Corp. employees scattered throughout offices in the city are still moving into the building. The staggered migration should end in December when about 3700 of them should be settled in the centralized headquarters. Another 1000 men and women will move into Mellon Bank quarters—the lower eight floors, the ground floor and two basements.

U. S. Steel people will occupy 30 floors and a basement while the lofty top floor will be leased by T. Mellon & Sons. The skyscraper will house office workers of all U. S. Steel Corp. operating subsidiaries, excepting railroads and utilities.

Cooling capacity of refrigeration equipment will have the melting effect of more than 5 million lb of ice daily. About 50 million lb of steam will be used yearly. One air conditioning system will take care of weather variations caused by sun and wind on the exterior of the building. Another will modulate the temperature of the core. About 3,300 individual Carrier "Weathermaster" units are being installed.

**Always on the Go**—Air in the building won't be given a rest. Capacity of air-moving fans amounts to 528,000 cu fpm. Fresh

air will stream into the building at 225,000 cu fpm. If the humidity is heavy outside, 11 gal of water per minute will be removed from the air. If it's dry outside, water will be added. Relative humidity will vary from 35 pct for winter to 50 pct in summer.

Air conditioning and other equipment will be housed on the entire 15th and 32nd floors. Two-thirds of the second basement will hold machinery.

Weighing 120,000 tons, 525 William Penn Place juts up 520 ft tall. Green-tinted windows cut glare and soak up infra-red rays. Fluorescent light shines down uniformly from ceiling fixtures. A mile of trailer trucks, bumper to bumper, was the carrying capacity needed to haul the initial lighting equipment.

As in all modern structures, use of stainless steel is lavish. About 780 tons went into window frames and spandrels between windows. Yet another 300 tons may have gone into the 25 elevators and other uses. Skeleton of the building is over 15,000 tons of structural steel in the frame, 2,200 tons in the Robertson "Q" flooring, 375 tons for air conditioning vents. If stretched out end to end, the copper pipe used in the building would total 36 miles.

Associated architects are W. K. Harrison, M. Abramovitz, of New York and W. Y. Cocken, of Pittsburgh. Turner Construction Co. is general contractor.

## Canada's New Diesel Giant

A high lustre paint job—gray, maroon, gold—and streamlining could not hide the massive power of the first Consolidation road diesel locomotive team. The 520,000-lb twins can develop 1600 hp each and send a fully loaded freight car sailing along the rails at 65 mph. A passenger version of the locomotive could speed its cars along at 110 mph.

Called "City of Kingston," the locomotive got homage last week at the diesel yards of the Canadian Locomotive Co., Ltd., in Kingston, Ont. It was christened by the Rt. Hon. C. D. Howe, Minister of Trade and Commerce, in rites that also commemorated Kingston's construction of North America's first road diesel locomotive.

The 3200-hp Consolidation will be the prototype of a fleet of 78 different C-line locomotives, ranging from 1600 to 9600 hp. All will be built at Kingston.

The Consolidation employs a new concept of construction—unitized installations in a standard carbody of an unchanging 56 ft, 6 in. in length. Variations in body design cannot change the length. Package units of power and generating equipment are installed into the standard carbody. Up to a total of four carbodies powered by any one of three Fairbanks-Morse Opposed-Piston Diesels can be linked to get multiple units.

Equipping single or multiple units with any one of six gear ratios, for various hauling jobs results in a total of 78 different locomotives from a single basic unit. Safety devices on the Consolidation sound an alarm when the engineer takes his load up a hill too quickly. If he becomes ill and his foot slips off the pedal, the Electrical Cabinet automatically brings the train to a stop. Dynamic Braking by reducing wheel power helps out the air brake system.

## Buy Ball Bearings From Europe To Take Pressure Off U. S. Firms

Certain sizes of ball bearings for precision-instrument use will be bought from European sources by U. S. manufacturers in order to relieve demands on domestic producers.

Consultants from the bearing industry and military personnel recently reported to the Munitions Board that capacity for turning out ball bearings in some sizes is available in Europe. Orders placed now, they said, would cause European manufacturers to produce bearings at an expanded rate and insure adequate supplies for other countries in the North Atlantic Treaty Organization.

Munitions Board has asked the military departments to encourage defense prime contractors to buy European ball bearings through U. S. bearing manufacturers and importers, maintaining that deliveries can be made within 3 or 4 months after orders are placed. Meanwhile, American manufacturers are expected to close the gap between production and current demand.

# STOCKPILING—New Aims, New Organization

**Larson heads Defense Materials Procurement Agency . . . Loose ends centralized under him . . . Half of stockpile goal made in June . . . Program grows . . . Cite Small for buying energy.**

Stockpiling of scarce strategic materials needed for the nation's defense effort will be directed by Jess Larson, former General Services Administrator, who has been named by President Truman as head of the new Defense Materials Procurement Agency.

Larson's nomination to the new post requires Senate approval, but no delay is expected from that body. His new agency will operate under the structure headed by Defense Mobilizer Charles E. Wilson and will be expected to consolidate a number of stockpiling functions currently distributed among GSA, Defense Minerals Administration, and the Economic Cooperation Administration.

Development of new supply sources, hitherto sponsored by the Munitions Board, will also be in the province of the new agency. Creation of DMPA followed closely release of the Munitions Board's semiannual report to Congress on stockpiling activities.

**Tempo Quickens**—This report disclosed that more than half the materials in a stockpile goal set at $8,300,000,000 were on hand or under contract at the end of June, and that the tempo of acquisition is rising. A spokesman for the board, however, says it might take as long as 5 years to reach the announced objective.

There have been 5 recorded changes in this objective since the end of 1946, when the goal was set at $4,536,000,000 worth of materials. In the past 6 months the amount of the objective has been cut by a sum which might exceed a half-billion dollars, though the report shows a decrease of only $290,000,000.

Munitions Board officials have said from time to time that development of substitute materials will eliminate the need for stocking some items on the list of 60-odd materials. Temporary purchase suspensions have been ordered when it was shown that strong government demand was driving prices steadily upward.

**Gets the Credit**—Dollar value of contracts placed during the first 6 months of 1951 was reported to be $1,645,000,000 in contrast to the figures for the preceding half-year—$430,000,000. Part of this acceleration of purchasing is ascribed to the diligent work of Munitions Board Chairman John Small, who has been in his job less than a year.

Congress has not been critical of Small's stockpiling efforts, realizing that he took office when the program was lagging badly. Congressional subcommittee reports last fall sharply condemned the board's handling of crude rubber for the stockpile, but made it plain that Small was not the target for the blast.

## Will Manage Atomic Operations

Maj. Gen. Thomas F. Farrell, deputy administrator of the Defense Production Administration, has been appointed assistant general manager for manufacturing, Atomic Energy Commission.

He will manage all atomic energy work concerned with getting supplies of uranium and other raw materials, the processing of feed materials for the production plants at Oak Ridge, Savannah River, Hanford and Paducah, the operation of plants and building of new ones.

## Assessments Aren't Dues

National Labor Relations Board has ruled that union assessments are not the "periodic dues" which employees may be required to pay in order to retain their jobs under a union-shop agreement permitted by the Taft-Hartley Act.

Union-security clauses of contracts are invalid because they require all employees who were union members to pay "general assessments" as well as monthly dues and initiation fees in order to retain their jobs, the board ruled.

### June Iron & Steel Production by Districts

As Reported to American Iron & Steel Institute

| BLAST FURNACE —NET TONS DISTRICTS | Number of Companies | Annual Capacity | PIG IRON June | PIG IRON Year to Date | SPIEGEL, FERRO-MANGANESE June | SPIEGEL, FERRO-MANGANESE Year to Date | TOTAL June | TOTAL Year to Date | TOTAL Pct of Capacity June | TOTAL Pct of Capacity To Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Eastern | 12 | 13,870,680 | 1,130,547 | 6,808,240 | 25,874 | 161,814 | 1,156,421 | 6,970,054 | 101.3 | 101.3 |
| Pitts.-Yngstn. | 17 | 27,070,520 | 2,215,113 | 13,004,113 | 26,558 | 150,141 | 2,241,671 | 13,154,254 | 100.6 | 97.9 |
| Cleve.-Detroit | 6 | 7,110,600 | 584,697 | 3,389,224 | ..... | ..... | 584,697 | 3,389,224 | 99.9 | 96.1 |
| Chicago | 7 | 15,684,040 | 1,282,628 | 7,408,754 | ..... | 5,694 | 1,282,628 | 7,414,448 | 99.4 | 95.3 |
| Southern | 9 | 5,310,740 | 451,968 | 2,662,613 | 5,489 | 48,499 | 457,457 | 2,711,112 | 104.7 | 102.9 |
| Western | 4 | 3,425,200 | 254,782 | 1,477,911 | ..... | ..... | 254,782 | 1,477,911 | 90.4 | 87.0 |
| Total | 38 | 72,471,780 | 5,919,735 | 34,750,855 | 57,921 | 366,148 | 5,977,656 | 35,117,003 | 100.2 | 97.7 |

| STEEL —NET TONS DISTRICTS | Number of Companies | Annual Capacity | TOTAL STEEL (Incl. Alloy Steel, Carbon Ingots) June | TOTAL STEEL Year to Date | TOTAL STEEL Pct of Capacity June | TOTAL STEEL Pct of Capacity To Date | ALLOY STEEL June | ALLOY STEEL Year to Date | CARBON INGOTS June | CARBON INGOTS Year to Date |
|---|---|---|---|---|---|---|---|---|---|---|
| Eastern | 25 | 20,823,230 | 1,674,610 | 10,283,252 | 97.7 | 99.5 | 136,071 | 837,294 | 340,333 | 1,966,751 |
| Pitts.-Yngstn. | 34 | 41,411,870 | 3,395,797 | 20,456,782 | 99.7 | 99.6 | 463,955 | 2,842,734 | 388,952 | 2,396,050 |
| Cleve.-Detroit | 8 | 9,601,940 | 809,347 | 4,802,081 | 102.4 | 100.8 | 73,644 | 387,448 | 108,533 | 614,795 |
| Chicago | 15 | 21,522,750 | 1,848,520 | 11,176,974 | 104.4 | 104.7 | 128,441 | 860,563 | 281,239 | 1,624,566 |
| Southern | 9 | 4,913,340 | 418,316 | 2,565,995 | 103.5 | 105.3 | 4,092 | 30,472 | 3,273 | 20,493 |
| Western | 11 | 5,956,520 | 510,370 | 2,986,819 | 104.1 | 101.1 | 9,442 | 62,950 | 33,399 | 196,517 |
| Total | 81 | 104,229,650 | 8,656,960 | 52,271,903 | 100.9 | 101.1 | 815,645 | 5,021,461 | 1,155,729 | 6,819,172 |

# INDUSTRIAL BRIEFS

**New Course Offered**—Next September the University of Michigan will introduce the first professional curriculum in Production Engineering at a U. S. University. Emphasis will be placed on professional training on production processes just as in the case of the present chemical and process engineering curricula.

**Gets Authorization** — The Federal Court at St. Louis authorized the MISSOURI PACIFIC RAILWAY to expend $20,823,000 for the purchase of 126 diesel electric locomotives. Of these 40 are to be for road freight service, 55 road switchers, 18 passengers and 13 local yard switchers.

**Expansion Program** — Cornerstone laying ceremonies marked the beginning of the largest expansion in the NORTON CO.'s machine division since 1943. The new expansion will consist of a six and a half acre single-story factory—740 ft by 300 ft adjoining a 360-ft by 100-ft office building.

**Technical Information**—U. S. Office of International Trade has signed contracts with ARMOUR RESEARCH FOUNDATION, Chicago, and GENERAL RAILWAY SIGNAL CO., Rochester, N. Y., to supply technical aid and service to Pakistan. Armour's contract provides aid in production of steel refractories and automotive bodies. The General Railway Signal contracts relates to development of railway signalling and traffic control.

**Recent Acquisition** — EASTERN STEEL & METAL CO., New Haven, Conn., has purchased the A. F. Holden & Co. property in West Haven. Eastern is an independent warehouse operating throughout New England as distributors of sheet, strip, rod, coil, wire, and tin mill black plate.

**New Unit Planned**—MODERN TOOL WORKS LTD., Toronto, will erect a plant addition to add 25,000 sq ft to cost approximately $300,000. Steel priorities have been arranged and construction will start without delay.

**Purchases Approved** — ECONOMIC COOPERATION ADMINISTRATION has authorized purchase in the U. S. and Canada of $500,000 worth of construction, mining and conveying equipment for Greece. Delivery date of Jan. 1, 1952, has been set.

**Announcement** — A new company GRANT-MACKENZIE CO., located at 17650 Ryan Road, Detroit, has been formed and will engage in general scrap iron business.

**New Process**—A new process that may save the nation tons of scarce strategic materials by coating metals with ceramics has been announced by SOLAR AIRCRAFT CO., San Diego, Calif. The process consists of new types of ceramic coatings developed by Solar that are extremely thin and strong and able to withstand intense heat and corrosive action.

**Ground Broken**—Ground was broken at the Pomona, Calif. plant of CONSOLIDATED VULTEE AIRCRAFT CORP. The Pomona plant, first integrated facility for mass production of guided missiles in this country, will be operated by Convair for the Navy's Bureau of Ordnance. First production project is an antiaircraft missle designed for shipboard or land launching.

**New Fairchild Plant**—FAIRCHILD ENGINE & AIRPLANE CORP., has awarded a contract for the construction of a new manufacturing building at Bay Shore, L. I., to John W. Harris Associates, Inc. The $2 million plant will be used by the Stratos Div. for the manufacture of aircraft accessories.

I've been working you too hard, Miss Johnson. I'm gonna take a few days off and give you a break.

**On Order**—Orders for rolling stock to the value of $35 million have been placed by the CANADIAN NATIONAL RAILWAYS, Montreal, which brings the value of new equipment on order and not delivered to a total of $104 million.

**Loftus Gets Contract**—Loftus Engineering Corp. has been awarded a contract by KILBY STEEL CO., Anniston, Ala., for two heating furnaces and two heat treat lines for forging and treating 105 mm shells.

**Extends Research**—Significant expansion of its technical research program is being undertaken by ALLOY CASTING INSTITUTE to help meet mounting defense mobilization needs and other engineering and equipment requirements dependent on the use of stainless steel castings.

**Change of Address**—NIAGARA MACHINE & TOOL WORKS have moved to new and larger offices at 15484 James Couzens Highway, Detroit.

**Packaging Course**—Industry packaging experts are invited to enroll in a new course on military packaging to be conducted by the Army at ROSSFORD ORDNANCE DEPOT, Toledo, Ohio. Civilians employed at the foreman or supervisory level by private firms, Army, Navy, Air Force and Marine personnel will receive instruction in basic methods of military preservation, packaging, packing and marking.

**New National Bureau Center**—The new NATIONAL BUREAU OF STANDARDS LABORATORY center at Corona, Calif., will be known as the Corona Laboratories and concerned with technical problems for the Department of Defense.

**Offices Moved**—A subsidiary of the Granite City Steel Co., GRANCO STEEL PRODUCTS CO. have moved their offices from Granite City, Ill., to space in a Dow Chemical Co. building in Madison, Ill. All production facilities will remain at the parent company's plant with the office, engineering and executive personnel moving to the new quarters.

# DEFENSE ACT—Straitjacket and Green Light

**Takes away some price control powers, gives authority on allocations, defense contract distribution . . . Industry watches to see what Washington will do with new act.**

Industry observers are watching to see what the government will do with the powers available to it under the new Defense Production Act.

Federal officials are empowered to take such diverse action as allocations of scarce materials, roll back prices on some nonagricultural items, and establishment of a small Defense Plants Administration to aid in distribution of defense contracts. Import controls can be maintained, and wage restrictions can be continued.

The government cannot deny sellers their customary percentage mark-up or control commercial rents. There is to be no licensing of firms subject to price control.

**Inventory Control** — In the scarce materials field, National Production Authority has some additional power to set "conditions" to inventory control regulations. The anticipated move to give universal application to the Controlled Materials Plan will give NPA an opportunity to employ what the act calls "due regard to the current competitive position of established business."

The agency has been instructed, however, that newer companies must get a "fair and reasonable" share of authorized production.

A setback for President Truman was inclusion of the so-called Capehart and Herlong amendments, calling for inclusion of cost absorption in computing ceiling prices. As written, the act permits Office of Price Stabilization to fix a customary percentage margin for groups of sellers or of commodities, relative to pre-Korea prices. Margins of price over cost are to be preserved only if sellers' records for the May 24-June 24, 1950 period show a historical basis for the margins.

Prices on any non-farm commodity or service may be rolled back if the new ceiling reflects the highest price received between Jan. 1 and June 24, 1950, plus adjustments for cost increases from that period through July 26, 1951. These costs, according to the act, include "material, indirect and direct labor, factory, selling, advertising, office and all other production, distribution, transportation and administrative costs." There is a stipulation that OPS can rule out "unreasonable and excessive" costs.

**Price Rises**—As OPS sees it, the authorized rollbacks may result in actual "roll-forward" action. This belief is based on a statement in the provision that any firm which contends that the authorized ceiling fails to take into account all influencing factors can appeal to OPS for a cost increase.

In the real property field, the act does not contain authority, asked by President Truman, for the government to build and buy defense plants and to require private plants to install new production processes. Remembering the cost of defense plants built during World War II, reported as about $14 billion Congress feared the inflationary implications of a new construction trend.

No change was made in the administration's existing power to install equipment in government and private plants and to institute new processes in government plants.

## Approves Freight Absorption

**Senate last week passed legislation permitting manufacturers to absorb freight charges. Proposed law states that any company may quote its own delivered prices if such prices are calculated independently and are quoted in good faith to meet competition.**

**The 42-34 Senate vote sends the bill to the House, where hearings are expected to begin shortly.**

## Industry Controls This Week:

**NPA Orders**

M-1, Direction 2—Unrates unfilled DOs after Sept. 30, changes lead time for carbon steel in September, gives new way of calculating tonnages.

M-4A, revision of M-4—Limits use of controlled materials in construction after Oct. 1 to NPA allotments. Asks applications to NPA from builders.

M-47A—Authorizes manufacturers to vary production so long as manufacturer does not exceed permitted usage of iron and steel.

M-78—Priority assistance for mining industry in obtaining maintenance, repair, and operating (MRO) supplies and minor capital additions. Those under Defense Minerals Administration may use symbol H-6 and priority rating DO-H-6 to get limited quantities of controlled materials, plus other materials for MRO use.

CMP Reg. 1, Amend. 2—Authorized orders for basic metals cannot be accepted unless they can be filled during quarter for which they are valid. Must be revalidated for subsequent quarter.

**OPS Orders**

Suppl. Reg. 48 to GCPR—Sets dollar and cents ceilings for remelt zinc. Rollback put remelt zinc prices in line with zinc scrap ceilings set June 1.

CPR 61—Establishes export ceiling prices at same level they had to domestic prices at outbreak of Korean war.

## Need Steel to Produce Coal?

Coal producers requiring steel, copper, or aluminum for construction projects are to apply to Defense Solid Fuels Administration on Form CMP-4C. Applications for the CMP materials may be combined with the application for authority to commence construction, which may be made on same form.

# DEFENSE ORDERS—Unfilled DOs to Lose Rating

**NPA tells mills unfilled defense-rated orders will lose rank after Sept. 30 . . . Direction 2 also changes lead time for carbon steel in September, changes calculating method.**

Unfilled defense-rated (DO) orders will be unrated after Sept. 30, National Production Authority has instructed steel producers. This instruction is contained in Direction 2 to NPA Order M-1, which became effective Aug. 2.

Direction 2 also:

(1) Changes the lead time for carbon steel products for September.

(2) Alters the method of calculating tonnages to be shipped to fill rated orders.

(3) Limits the amount of rated orders and warehouse converter orders that may be accepted.

(4) Requires mills to fill a minimum number of distributor and converter orders regardless of the amount of rated orders received.

(5) Directs mills to fill a minimum amount of orders for alloy and stainless steel placed by distributors and converters.

(6) Makes provision for carryover of defense-rated orders from July or August to September.

This direction confirmed telegraph instructions issued between July 5 and 25, as did Direction 2 to NPA order M-6. This latter direction required each iron or steel producer to ship to each distributor customer stipulated minimum amounts of certain grades of steel products in October and in subsequent months. These minimums are named as:

(1) 85 pct of average monthly tonnage of stainless tubing shipped during the base period Jan. 1-Sept. 30, 1950, of which a minimum of 80 pct must be in nickel grades.

(2) 85 pct of average monthly tonnage of other stainless steel product shipped during the same base period, with a minimum of 15 pct in nickel grades.

(3) 100 pct of average monthly base period shipments of commercial quality alloy steels in any grades with a melting range of .70 maximum nickel, or .15 maximum molybdenum used individually or in combination, with or without chromium, or any non-nickel or non-molybdenum bearing grades, with or without chromium.

## Tool Builders Get Super Priority

Machine tool builders planning an expansion of facilities are empowered to make first claim to output of their own industry, under privileges granted them by the National Production Authority.

This is the first indication from the government that its 1-band priority system won't work.

Tool builders unable to get metalworking equipment have been instructed to apply to NPA for assistance.

Agency officials will review the order board to locate the proper tool, preferably one that is ready for immediate shipment. If, after review of the application, it is determined that the recent applicant should get "super priority" the builder will be ordered to divert the tool from his intended customer to the machine tool manufacturer.

Authorization for such consideration was sought by industry representatives in a meeting with NPA officials recently. At that time, the priority ratings they were using meant they had to wait in line with other industries having tool priorities.

In announcing the new policy, NPA Chief Manly Fleischmann said the present shortage is slowing down the rate of increase in such key mobilization programs as jet engine production.

## DEFENSE CONTRACTS

Week of Aug. 6, 1951

**Trucks**—GMC Truck & Coach Div., Pontiac, Mich.
**Trucks**—International Harvester Co., Washington
**Trucks**—Federal Motor Truck Co., Detroit
**Trucks**—Mack Mfg. Corp., Washington
**Semi-trailer**—Gramm Trailer Corp., Lima, Ohio
**Semi-trailer**—Fruehauf Trailer Co., Detroit
**Semi-trailer**—J. M. Nelson Mfg. Co., Ottawa, Ohio
**Cabinet, spare parts**—Dehler Mfg. Co., Inc., Chicago
**Block, wire rope**—Creative Metals Co., Emeryville, Calif.
**Plate, bearing differential left**—Advance Mfg. Co., Detroit
**Bearings**—Federal Mogul Corp., Coldwater, Mich.
**Chain**—American Chain & Cable Co., York, Pa.
**Ammunition box**—Consolidated Box Co., N. Bergen, N. J.
**Cartridge case cups**—Scovill Mfg. Co., Waterbury, Conn.
**Machine, milling**—Nichols-Morris Corp., New York
**Forgings, body, steel**—National Tube Co., Philadelphia
**Compass**—Fee & Stemedal Co., Chicago.
**Subcaliber mortar trainer**—Delenbarger Machine Co., Inc., New York
**Gages, inspection**—Pipe Machinery Co., Cleveland
**Forgings**—Cameron Iron Works, Inc., Houston
**Cannon parts**—Buffalo Arms, Inc., Buffalo
**Ammunition cans**—Eclipse-Pioneer Div., Bendix Aviation Corp., Teterboro, N. J.
**Spare parts**—Vulcan Rail Construction Co., Maspeth, N. Y.
**Valves, ventilation heaters**—Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Washington
**Signal generator**—O. E. Szekely & Associates, Inc., Philadelphia
**Signal generator**—Lavoir Laboratories, Inc., Morganville, N. J.
**Voltmeter**—Weston Electrical Instrument Corp., Philadelphia
**Chairs**—American Seating Co., New York
**Cable assys.**—Walter Kidde & Co., Inc., Belleville, N. J.
**Desks**—Jamestown Metal Corp., Jamestown, N. Y.
**Flanges, drilled**—Charles S. James Co., San Francisco
**Flanges, drilled**—Walworth Co., New York
**Ingots, aluminum**—Reynolds Metals Co., Camden, N. J.
**Maintenance parts**—Aircooled Motors Inc., Syracuse, N. Y.
**Voltmeter, Air Force-Navy type**—Radio City Products Co., New York
**Voltmeter, Air Force-Navy type**—Chicago Industrial Instrument Co., Chicago
**Valves**—Kerotest Mfg. Co., Pittsburgh
**Sockets, separable**—Moeller Instrument Co., New York
**Compressor, air**—DeVilbiss Co., Toledo
**Welder, rectifier type**—Westinghouse Electric Corp., Detroit
**Wrench, single-head-open-end**—LeRoy Machine Co., LeRoy, N. Y.
**Cannon parts**—Worthington Mower Co., Stroudsburg, Pa.
**Cannon parts**—Richmond Foundry & Mfg. Co., Inc., Richmond, Va.
**Open link chain**—Woodhouse Chain Works, Trenton, N. J.

*Continued*

# MANUFACTURERS—Can Shift Allotment Use

**NPA permits durable goods makers to use metal allotments on goods in stronger demand . . . Flexibility will permit more total output . . . Total CMP waits official stamp.**

Greater flexibility for manufacturers in the use of iron and steel quotas is predicted by National Production Authority officials on the basis of their modified consumer durable goods order, M-47A.

Now, NPA says, a manufacturer of two or more items will be able to vary production almost as if he were under free competitive conditions, so long as he doesn't exceed his permitted usage of iron and steel.

As an example builders of refrigerators and washing machines, reported to be in good supply, can turn their basic materials into ranges, vacuum cleaners, and other products for which there is stronger consumer demand.

Manufacturers also may disregard, while computing base period and actual usage, weight of materials contained in purchased components or subassemblies for which a Controlled Materials Plan third quarter allotment was issued. There is, however, no change in the total amount of iron and steel permitted users in the current quarter.

**Producers Protest**—Allocations of the materials involved probably will become more widespread within a short time. Defense Production Administrator Manly Fleischmann's statement that he "may decide" to broaden the metals rationing system was being interpreted as a virtual assurance that the open market in steel, copper, and aluminum was on its way out.

A government decision to install a 100 pct control plan was made over the protests of industrial firms now covered by CMP. Spokesmen have complained that normal producer-consumer relationships are being disrupted, and that tickets for materials are not a guarantee of supply. Nonetheless, Fleischmann says he is convinced consumer-goods production will work better under full controls.

**Permit More Output** — Meanwhile, amendments to M-47A will permit some manufacturers to increase production without additional grants of material, where the use of allotted parts or subassemblies containing copper or aluminum has limited output. Products likely to be affected are refrigerators, vacuum cleaners, washers, power mowers, and other consumer durables equipped with gasoline or electric motors bought from another manufacturer.

There is still a prohibition on use of copper and aluminum as a decoration or ornament on another functional part.

## Whitman Will Head Military Research & Development Board

Walter G. Whitman, head of the chemical engineering department at Massachusetts Institute of Technology, will direct activities of the nation's top military research group, the Defense Dept.'s Research & Development Board.

He was a member of the board's committee on fuels and lubricants from September, 1949, to July 1 of this year. He succeeds William Webster, New England Electric System executive, as RDB chairman.

Another new appointee to an RDB post is Dr. Lawrence W. Bass, vice-president of U. S. Industrial Chemicals, Inc., of New York. He will head the board's committee on equipment and materials.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# CMP HELP—How Much for Small Business?

**DPA weighs all CMP facets to determine basic metals help to small industry . . . Report on small business in defense role shows ground lost after Korea recovered this year.**

All aspects of the Controlled Materials Plan are being reviewed and evaluated by Defense Production Administration to determine how much help on basic metals small business in defense roles will need. DPA'S Office of Small Business is blueprinting a program to deliver stipulated amounts to small firms for future operations.

Small business, DPA said, is contributing much to national security efforts in the services and distribution fields. Small manufacturers, though important in the production of component parts and certain specialized end-items, are far less numerous than service and distribution providers.

In the first half of 1951, firms with fewer than 500 employees retrieved much ground lost during dislocations that followed the Korean fighting. DPA's report on "Small Business in the Defense Program" said there were 14 pct fewer business failures in the first 25 weeks of 1951 than in the like period last year.

By the end of the first 9 months after Korea, the report said, employment in metalworking plants with fewer than 100 workers had increased 22 pct. For those plants with between 100 and 500 workers, the increase was about 23 pct.

**SOS Calls Honored**—A contrasting figure of 15 pct was shown as the expansion of plants with more than 500 employees.

DPA records show that firms with fewer than 500 employees filed about 19,000 requests for assistance in obtaining materials and equipment between Apr. 1 and June 15. Review of about half of these requests indicated that in more than 70 pct of cases favorable action or a "measure of assistance" was provided.

| Commodity | Requests | Action On |
|---|---|---|
| Steel | 600 | 70 Pct |
| Aluminum | 769 | 87 Pct |
| Copper | 1000 plus | 65 Pct |
| Tin, lead, and zinc | 445 | 80 Pct |
| Machine tools and equipment | 2202 | 98 Pct |

Coordination of small business policies in DPA has been directed by a small business executive committee.

## Can Deliver Brass Mill Scrap At Over Ceiling Price to Aug. 13

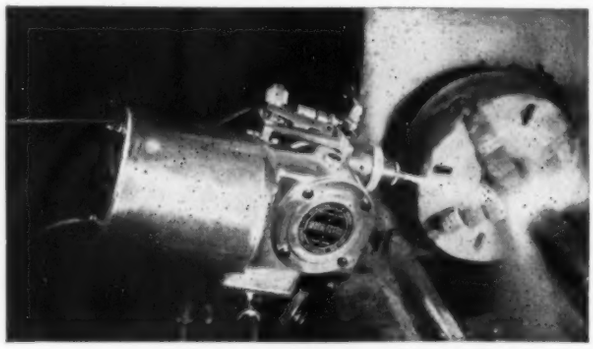
Brass mill scrap containing tin and copper alloy scrap may be delivered at higher-than-ceiling prices until Aug. 13, provided the higher prices were contracted for and the material was in transit prior to July 31, the Office of Price Stabilization has ruled.

Rollback prices described in amendments to Ceiling Price Regs. 46 and 47 are now in effect for brass mill and copper alloy scrap except as slated. After Aug. 13 these rollback prices will apply.

**Lower Tin Prices**—The drop in the world price of tin computed at $1.50 per lb when CPR 46 and 47 were issued in June, necessitated the rollback amendments, OPS said. Lower tin-content scrap prices are based on an approximate tin price of $1.15 per lb, which is slightly higher than latest available quotations. The agency established new prices with the realization that tin prices fluctuate almost daily.

Planned reductions in brass mill scrap ceilings range from .25¢ per lb for some grades to 3.5¢ for others.

The ceiling for bellmetal grade copper alloy scrap has been set at 31.75¢ per lb, in contrast to a previous ceiling of 36.25¢.

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Continued

## Two-Thirds of Chicago Firms Surveyed Have Defense Contracts

Almost two-thirds of Chicago manufacturers queried in a survey held by the Chicago Assn. of Commerce & Industry have defense contracts. Of those holding contracts 96.7 pct are in production on defense work. About 50 pct of the surveyed reported they are still in tooling up stages for some of the defense work.

The survey revealed that nearly three-quarters of the manufacturers responding are actively seeking defense contracts at the present time, that 75 pct of those seeking contracts have been successful in acquiring them, and that some manufacturers are receiving defense orders faster than they can handle them, without any solicitation.

Of the manufacturers with defense orders, 35 pct said that such orders involved less than 10 pct of their total volume of production; 22 pct said defense production was taking up between 10 and 20 pct of their capacity, and 26 pct stated that defense work is occupying between 20 and 60 pct of their total volume. Only 9 pct indicated that they were doing more than 60 pct defense work.

## Stimulate Joint Production

Defense Mobilizer Charles E. Wilson says the recent revival of the Joint Industrial Mobilization Committee of the United States and Canada is expected to stimulate joint defense-production efforts.

Wilson is preparing to name industry task groups to deal with specific problems such as joint production of weapons, mobilization of specific areas (such as chemicals), and intensive development of minerals and other raw materials.

## Plan MRO Export Program

A longer-range program for export of maintenance, repair and operating (MRO) materials is being worked out by the National Production Authority and Office of International Trade.

## Seal Up CMP's Open End

**The Controlled Materials Plan will be extended to cover virtually all production using steel, copper and aluminum, beginning with the fourth quarter because demand will be greater than supply for the next 18 months.**

**This action, long forecast by THE IRON AGE, was announced Tuesday night by National Production Authority's Manly Fleischmann.**

**Structural steel requirements are running at 223 pct of supply, he explained. Carbon steel needs, yardstick for the industry, are about 147 pct of supply and aluminum, 145 pct. Copper requirements range from 156 pct for copper wire to about 181 pct for foundries, according to NPA tabulations.**

**Distribution must be completely controlled, he said, if all, especially smaller manufacturers of consumer durables, are to have an equitable share.**

## Metals Castings Makers Told To Set Ceilings Under New CPR 60

Producers of metal castings have been ordered to determine ceiling prices for their products on the general basis of prices in effect on Jan. 25, 1951, with an allowance for changes in metal costs since that date.

A new Office of Price Stabilization order (CPR 60) tells how to set maximum prices at the producer's level. Effective date for CPR 60 is Sept. 1, earlier if desired.

Castings covered are: Die, gray iron, high alloy steel, malleable iron, manganese steel, nonferrous, railroad specialty, and carbon or low-alloy.

## Extend Escalator Rise Life

Wage Stabilization Board has extended for an indefinite period its regulation (General Wage Reg. 8) authorizing cost-of-living escalator clauses.


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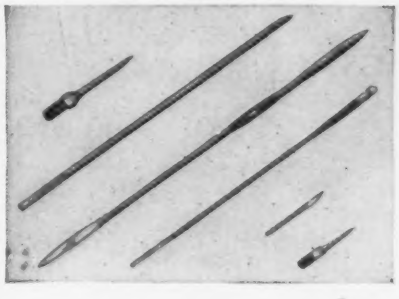

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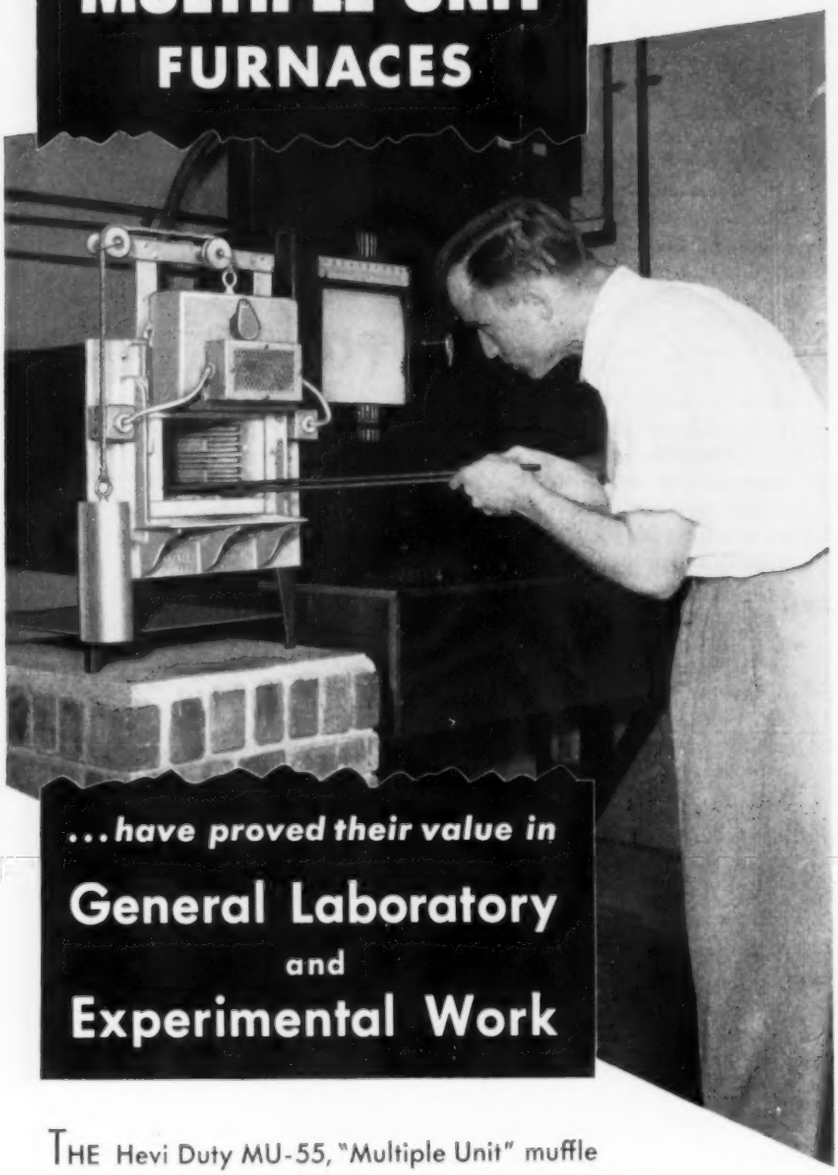

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## Mills Told Not to Take Metals Orders They Cannot Fill on Time

National Production Authority reminds mill operators that they may not accept an authorized order for steel, copper, or aluminum if it cannot be filled during the quarter for which it is valid.

Such orders may be accepted only if they are revalidated for a subsequent quarter. This clarification is spelled out in Amendment 2 to CMP Reg. 1.

## How to Raise Wages

Wage Stabilization Board has ruled that employers may grant merit and length-of-service wage increases without WSB approval if such increases are made under one of the following three options:

1. According to past practice, under which an employer may apply to the current year his actual 1950 experience.

2. Under a "6 pct plan" limiting the total of such increases to 6 pct of the aggregate straight-time rates for employees grouped as a unit for administration of wage schedules.

3. According to an established plan for a group of employees as the plan is defined in the regulation and in actual operation on Jan. 25, 1951.

## New NPA Construction Control

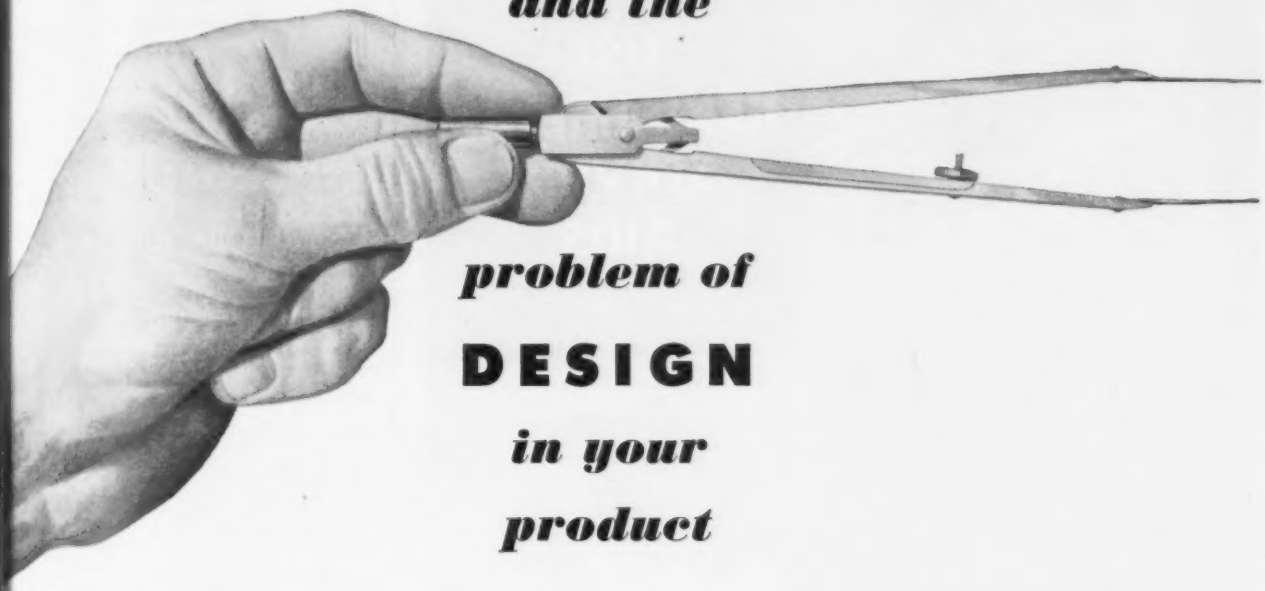
Use of controlled materials in all construction except a few amusement projects will be limited, after Oct. 1, to minimum amounts or to specific allotments issued by National Production Authority.

NPA has also ordered a partial freeze on all construction prior to Oct. 1, except in those cases where in small amounts of metal are involved or foundations have been poured. NPA revoked the old basic construction order, M-4, and issuance of M-4A in its place.

Builders intending to use more than minimum amounts of metal must submit applications to NPA at once, in order to receive allotments at the time the freeze ends.

# MAGNESIUM

***and the***



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IN PRODUCT DESIGN, magnesium offers the outstanding advantage of a high weight/strength ratio. This single factor offers many interesting applications for metal users.

Suppose your product . . . up for re-design . . . has met a sales penalty of excessive weight. In re-designing you have a choice of several metals. But only one . . . magnesium . . . can offer you the best combination of light weight, strength and rigidity.

Perhaps your product requires additional parts to increase its efficiency, its saleability. Yet the addition of those parts may mean undesirable weight. By re-designing with magnesium, many manufacturers have found it possible to add improvements without increasing weight.

Another type of design advantage is often utilized where no weight saving is necessary. Because of its strength/weight ratio, magnesium makes possible greatly simplified construction with resultant lower costs. Recently a large, complex structure was re-designed in magnesium with a reduction of 69% in the number of pieces required and reducing the number of fasteners 62%.

Magnesium offers real flexibility in design with a variety of alloys possessing characteristics of strength, toughness, machinability and corrosion resistance. Fabricated magnesium is produced in all common forms: castings, forgings, extrusion, sheet and plate; and can be economically worked by all standard shop practices.

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Today, magnesium like many other metals, is a tremendously important part of our defense effort, particularly where light weight is a specification in design. As a result, the supply for commercial uses is often limited. But tomorrow, magnesium promises new horizons in the field of metal supply. *The seas, at our own shores, can provide 100 million tons per year for a million years without significantly reducing the supply.*

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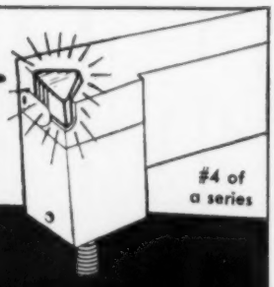
# Tool Saving Tips



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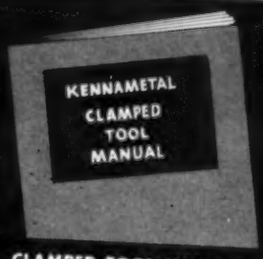


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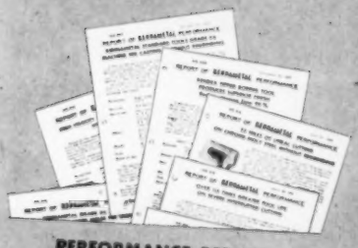

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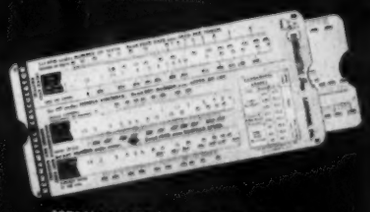

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Central Vermont Public Service Corp., Western Vt., generation of electricity, $2,122,610, $1,987,610, 25.

Narragansett Wire Co., Pawtucket, R. I., infantry wire, $125,063, $125,063, 75.

Noma Electric Corp., Derby, Conn., submarine tele. & power cable, $1,645,000, $174,000, 75.

Greenman Steel Treating Co., Worcester, Mass., commercial heat treating, $49,500, $49,500, 60.

American Bosch Corp., Springfield, Mass., tank telescope mounts, $389,528, $389,528, 60.

Marlin Rockwell Corp., Jamestown, N. Y., ball bearings, $2,996,277, $2,539,434, 75.

The Sperry Corp., Great Neck, N. Y., precision scientific instruments, $373,173, $292,233, 75.

The Sperry Corp., Great Neck, N. Y., precision scientific instr., $741,015, $690,007, 75.

The Sperry Corp., Great Neck, N. Y., precision scientific instr., $596,632, $537,548, 75.

Tide Water Associated Oil Co., Bayonne, N. J., petroleum storage, $2,265,872, $2,265,872, 50.

Bouchard Transportation Co., Inc., New York, N. Y., diesel tug, $210,000, $210,000, 75.

Wm. Steinen Mfg. Co., Newark, N. J., screw machine parts for aircraft, $84,514, $84,514, 90.

REF Mfg. Corp., Mineola, L. I., N. Y., hatches for aircraft, $165,022, $163,842, 75.

Jones & Laughlin Steel Corp., Pittsburgh, oil barge unloading, $94,650, $94,650, 65.

North American Refractories Co., Mount Union, Pa., silica brick, $176,623, $130,803, 60.

Empire Steel Castings, Inc., Temple, Pa., steel castings, $603,606, $603,606, 75.

R-S Products Corp., Philadelphia, industrial valves, $27,917, $27,917, 90.

Clary Multiplier Corp., Downington, Pa., packaging of aircraft bearings, $68,617, $68,617, 80.

Carson Steel Co., McKees Rocks, Pa., ferrous scrap, $45,622, $45,622, 75.

Superior Steel Corp., Carnegie, Pa., copper alloy, steel strip, $60,000, $60,000, 60.

Blaw-Knox Co., Pittsburgh, turrets (tanks), $800,000, $800,000, 75.

Gudebrod Bros. Silk Co., Inc., Pottstown, Pa., surgical sutures, $47,095, $47,095, 60.

Kennametal, Inc., Latrobe, Pa., ordnance, $648,191, $648,191, 80.

Superior Steel Corp., Carnegie, Pa., ordnance, $1,527,086, $1,527,086, 75.

Greenville Steel Car Co., Greenville, Pa., transportation-rail, $111,712, $31,362, 60.

Hastings Instrument Co., Inc., Hampton, Va., electronic receivers and indicators, $288,463, $255,315, 80.

B&O Railroad Co., Baltimore, Md., transportation service, $3,500,000, $3,500,000, 50.

S. H. Robinson & Co., Inc., Knoxville, Tenn., scrap iron, steel, copper, $81,500, $76,500, 75.

A. P. Ward & Son, Inc., Pensacola, Fla. (Home Port), transportation (water), $315,000, $315,000, 80.

Akron Scrap Iron Co., Akron, Ohio, scrap iron, $86,736, $59,823, 75.

Parker Appliance Co., Cleveland, Ohio, gaskets, $220,501, $201,370, 85.

Timken Roller Bearing Co., Canton & Perry Twps., Stark Co., Ohio, roller bearings, $747,695, $747,695, 75.

Butcher & Hart Mfg. Co., Toledo, Ohio, lockwashers, screw assemblies, $35,398, $19,529, 85.

Hancock Steel Co., Inc., Detroit, metal services, $348,814, $348,814, 60.

The M. D. Friedman Co., Portsmouth, Scioto Cty., Ohio, scrap iron, $202,000, $202,000, 75.

General Motors Corp., Lansing, Mich., aircraft parts, $9,155,000, $9,155,000, 75.

Deslauriers Column Mould Co., Inc., Detroit, rotor governors, $35,695, $35,695, 80.

Ready-Power Co., Detroit, repair of generator sets, $11,439, $11,439, 75.

Barth Stamping & Machine Works, Inc., Cleveland, tools & dies, $622,103, $589,933, 60.

McKay Machine Co., Youngstown, Ohio, metalworking machinery, $322,492, $147,492, 60.

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Reduction in Area.....86.1%

**That's high quality metal! Metal destined for a high alloy casting which has to meet some pretty rigid specifications!**

The story we want to tell here is about our Testing Facilities. We have right in our foundry every conceivable testing facility needed when checking static or centrifugal high alloy castings for industry. Where required, we make complete chemical, metallurgical, and mechanical checks and tests. And have both a 400,000 volt X-ray unit and gamma-ray unit, for checking the final casting for hidden flaws.

As we see it, the only way to assure customers of high quality castings is to have and use all necessary facilities for testing and checking the heat, pour and finished casting.

DURALOY

THE DURALOY COMPANY

*Office and Plant:* Scottdale, Pa. • *Eastern Office:* 12 East 41st Street, New York 17, N.Y.

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San Francisco: JOHN D. FENSTERMACHER 1241 Taylor Street

METAL GOODS CORP. Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa


## • *News of Industry* •

**Buda Company**, Harvey, Ill., diesel engines, $34,443, $25,839, 75.

**R. Krasberg & Sons Mfg. Co.**, Chicago, oil seals (metal), $10,391, $10,391, 90.

**Miller Compressing Co.**, Milwaukee, Wis., scrap metal, $52,541, $45,161, 75.

**Master Machine & Tool Co.**, Chicago, machining metal parts, $181,045, $66,045, 80.

**Chicago Heights Iron & Supply Co.**, Chicago Heights, Ill., scrap iron, $32,500, $32,500, 75.

**Larson & Quigley Co.**, Chicago, lock nuts, $77,500, $70,000, 75.

**The Wilson Transit Co.**, Waterways-Great Lakes, transportation (water), $3,500,000, $3,500,000, 80.

**Bailey Products Corp.**, Union City, Ind., parts, fuze, $14,000 $14,000, 90.

**Cessna Aircraft Co.**, Wichita, Kansas, cargo airplanes, $113,435, $108,045, 75.

**General Compressed Steel Corp.**, St. Joseph, Mo., scrap iron, $29,087, $27,087, 75.

**Lyons Machine & Mfg. Co.**, Lyons, Kansas, aircraft parts, $35,311, $34,879, 90.

**Whitney Chain Co.**, Longview, Texas, power transmission chain, $4,795,537, $3,866,137, 75.

**United Aircraft Corp.**, Dallas, aircraft, $1,837,909, $1,578,032, 75.

**St. Charles Pipe Line Co.**, Arkansas & San Patricio Cos., Tex., gas pipe line, $992,798, $992,798, 80.

**D. C. Hall Transport, Inc.**, Dallas, transportation (motor freight), $162,570, $115,367, 70.

**Central Freight Lines, Inc.**, Killeen, Texas, storage (freight), $35,220, $31,370, 70.

**Baton Rouge Tin Compress**, Baton Rouge, La., processing tin, $39,356, $38,532, 75.

**Tenn-Tex Alloy & Chemical Corp.**, Houston, ferromanganese, $1,254,779, $1,254,779, 85.

**Basalt Rock Co., Inc.**, Napa, Calif., steel pipe, $2,055,108, $1,983,981, 60.

**Worth Mfg. Co., Los Angeles**, Calif., parts for aircraft, $3,106, $3,106, 90.

**Royal Machine Works**, Inglewood, Calif., aircraft parts, $10,631, $10,631, 90.

**McCulloch Motors Corp.**, Los Angeles, Calif., aircraft engines, $2,819,695, $2,069,695, 80.

**Boeing Airplane Co.**, Seattle, aircraft, $8,330,000, $8,330,000, 75.

**Boeing Airplane Co.**, Seattle, aircraft, $185,000, $185,000, 75.

**Seattle Iron & Metals Corp.**, Seattle, scrap iron, $25,000, $25,000, 75.

## STEEL CONSTRUCTION NEWS

**Reinforcing bar awards this week:**

1890 **Tons,** Willow Springs, Ill., Buick Jet Engine Plant, to Ceco Steel Products Co.

690 **Tons,** Westville, Ind., Dr. Norman Beatty Memorial Hosp., to Joseph T. Ryerson & Son.

600 **Tons,** Des Moines, Solar Aircraft, to Laclede Steel Co.

565 **Tons,** Chanute Field, Ill., mess hall and administration building, to Ceco Steel Products Co.

560 **Tons,** Ft. Wayne, Parkview Memorial Hosp., to Hagernon Const. Co., Ft. Wayne.

330 **Tons,** Milwaukee, library for Marquette U., to Concrete Steel Co.

250 **Tons,** Rock Island, Ill., St. Anthony Hospital, to Joseph T. Ryerson Co.

200 **Tons,** South Bend, Fisher Dormitory, Notre Dame, to Olney J. Deal Co.

176 **Tons,** Evergreen Park, Ill., Water Works, through Northern State Co., Chicago, Contractor, to Truscon Steel.

150 **Tons,** Gary, school at 27th and Jackson, to U. S. Steel Supply Co.

140 **Tons,** Chicago, O'Hare field paving, to Calumet Steel Co.

**Reinforcing bar inquiries this week:**

700 **Tons,** Kenosha, Wis., Nash Motors Bldg. 44. Bids due Aug. 6.

600 **Tons,** Davenport, Iowa. Oscar Mayer Packing Co.

600 **Tons,** Hagerstown, Md., U. S. Engineers at Blue Ridge summit.

500 **Tons,** Nekoosa, Wis., Nekoosa Edwards Paper Co.

400 **Tons,** Weston, Wis., High School.

200 **Tons,** Granite Falls, Minn., Minnesota Valley Steam Plant.

150 **Tons,** East Joliet, Ill., E. J. and E. railroad office and operation bldg.

150 **Tons,** Cleveland, Ohio, Gordon Park.

140 **Tons,** Chicago, Phoenix Trimming Co.

# Here is *Exactly WHY* a V-Belt with CONCAVE SIDES Gives You *Longer Wear!*

To see for yourself how a V-Belt that has *concave sides* is certain to give longer wear, just make this simple test:—

**Pick up any V-Belt you have at hand. Bend that belt as it bends around a pulley. As it bends, grip its sides between your fingers. Here is what will happen *everytime*.**

If the V-Belt you are testing has *straight sides*, you can feel those sides *bulge out* as the belt bends. This out-bulge forces the sides of the belt to press *unevenly* against the V-Pulley and you naturally get *concentrated* wear just where the bulge is greatest—as shown in figure 1-A, at right.

**Now, make this same test with the belt that is built with Concave Sides—the Gates Vulco Rope!**

Whereas you felt an *out-bulge* when you bent a belt with straight sides, you find that the *Concave Sides* merely fill out and become *perfectly straight*. The sides therefore *press evenly* against the V-Pulley. This distributes the wear *uniformly* across the *full width* of the belt. Naturally, this means longer belt life and *lower* belt *costs* for you!

**Only V-Belts made by Gates are built with concave sides. Whenever you buy V-Belts, be sure that you get the V-Belt with the Concave Sides—The Gates Vulco Rope!**

**What Happens When a V-Belt Bends**

**Straight-Sided V-Belt**

Fig 1

Fig 2

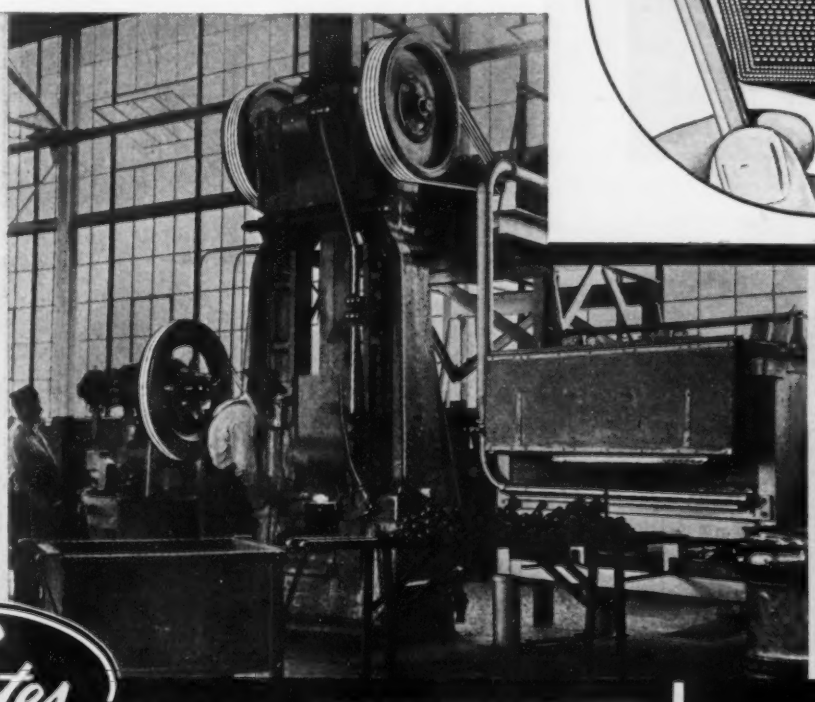
**Gates Vulco Rope with Concave Sides**

Fig 1-A

Fig 2-A

**How Straight-Sided V-Belt Bulges in Sheave-Groove. Sides Press Unevenly Against V-Pulley Causing Extra Wear At Point Shown by Arrows.**

**The Concave Sides Fill Out to a Precise Fit in the Sheave Groove. No Side Bulge! Sides Press Evenly Against the V-Pulley — Uniform Wear — Longer Life!**



This drop hammer in the plant of Kortick Manufacturing Company of San Francisco is operated by the Gates Vulco Rope Drives shown. Mr. W. H. Reiman, Plant Supt., says: "...a great improvement in the speed of the return stroke... gives us a positive drive without slip, yet one that absorbs the shock of picking up the ram repeatedly."

A CS-517

Gates®
Hose V-Belts
Molded Rubber Goods
for Industry

VULCO ROPE DRIVES
ENGINEERING OFFICES AND JOBBER STOCKS
IN ALL INDUSTRIAL CENTERS

THE GATES RUBBER COMPANY
DENVER, U. S. A.
*The World's Largest Makers of V-Belts*

## Who can give fast service in times like these?

THAT'S exactly what this man does. He's Frank Byrne, Brainard Strapping System representative who solves customers' problems out of our Cleveland office. When a company calls and wants help in a hurry, Frank hits the road for their plant, stays there until all's well. His personal attention to packaging and shipping problems—and the fact that he uses his noodle to solve them—is typical Brainard service.

The big difference in steel strapping is not so much in the strapping itself, but in what you get out of it . . . how you use it, how you make it cut costs. Brainard makes sure you *do* cut costs by being on the alert always to help you keep the goods moving. Frank Byrne here is only one of our many representatives well-spotted throughout the U. S. A. In Canada there's P. J. McArthur in Toronto. If you move materials with steel strapping, you should know us *and* our man nearest you.

COMPLETE STRAPPING SERVICE. LIGHT AND HEAVY DUTY STRAPPING. TOOLS AND ACCESSORIES

Brainard STEEL COMPANY

WRITE: STEEL STRAPPING DIVISION, WARREN, OHIO

# 11

Got the habit of reading page 11?
Newsfront is there EVERY week.
Designed to save you time and keep
you up to date on what's new in the industry.
IT PAYS TO READ IRON AGE ADS TOO!


# *publications*

*Continued from Page*

## *Grinding wheel bond*

The new vitrified silicon carbide grinding wheel bond, "XL," is described in a recently published 4-p. folder. Details on applications and advantages of "XL" bonded wheels for tungsten carbide tool grinding, plus specifications of the most popular straight and cup wheel sizes for rough and finish grinding are described. *Chicago Wheel & Mfg. Co.*

**For free copy insert No. 25 on postcard p.**

## *Anti-corrosion slide rule*

A new slide-rule, designed for those interested in cathodic protection of pipelines, gives required magnesium anode size and life, length of pipe protected and current output. Pipe size and coil resistivity are the two factors that must be known to use the device. *Federated Metals Div., American Smelting and Refining Co.*

**For free copy insert No. 26 on postcard p.**

## *Measures air pollution*

A fully automatic, electronic gas analyzer that uses electrolytic conductivity to measure pollution of air by sulfur dioxide is described in an illustrated 8-p. bulletin. The new equipment records actual concentration of $SO_2$ in parts per million, the average concentration integrated over half-hour periods, its own "zero" reading every 30 min. and notes each cubic foot of air sampled. *Leeds and Northrup Co.*

**For free copy insert No. 27 on postcard p.**

## *Dynamometer booklet*

A new two-color booklet on G-E Type TLC (cradled) 250-volt, 4-q dynamometer for direct connected testing of internal combustion engines, electric motors, pumps, blowers, and compressors has been prepared. Photographs show dynamometer construction and a table of full-load horsepower and speed ratings, and a chart showing typical performance curves are included. *General Electric Co.*

**For free copy insert No. 28 on postcard p.**

*Resume Your Reading on Page 36*

# MACK TRUCKS...

# Today's Wise Buy

Now, more than ever, it pays to look upon your truck purchase as an investment...one that should yield you long-term dividends in dependability and economy. Measured that way, you'll find there's no other truck to match a Mack.

Long-lasting, profit-making Mack performance is well demonstrated by Mack Model A-40 Series (23,000 lbs. g.v.w. to 53,000 lbs. g.c.w.) which cover a wide utility range as trucks, tractors, four or six-wheelers.

Like all Macks, these popular trucks are built with extra strength and sturdiness in every part...give you assurance of sustained, uninterrupted operation should trucks become difficult to replace during the uncertain period ahead.

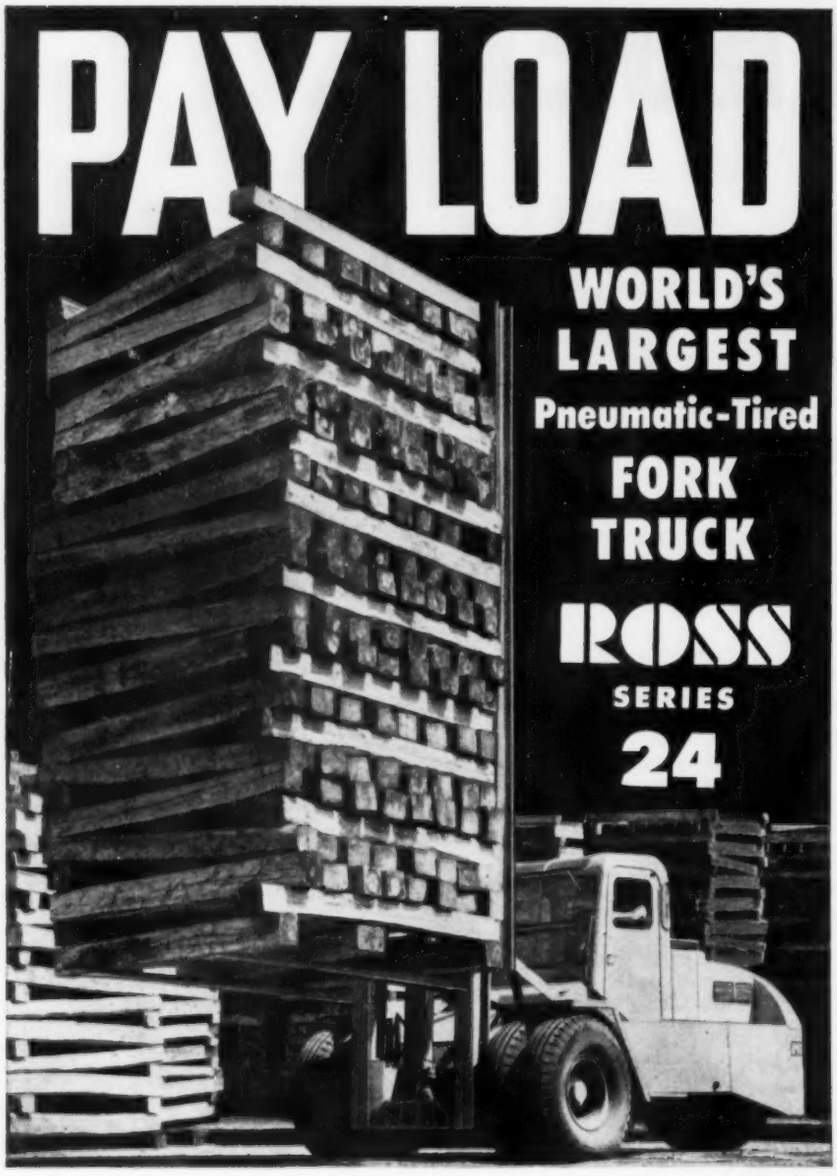
Your nearest Mack branch or distributor will explain to you what "Built Like A Mack" means in extra long life and low-cost operation...why Mack is *today's wise buy* in trucks.

Mack TRUCKS

***...outlast them all***

Mack Trucks, Empire State Building, New York 1, N.Y. Factories at Allentown, Pa.; Plainfield, N. J.; Long Island City, N. Y. Factory branches and distributors in all principal cities for service and parts. In Canada: Mack Trucks of Canada, Ltd.

**Peter A. Frasse Co., Inc. of New York City found out that Mack trucks were a "wise buy" way back in 1920. They've been buying them ever since. Latest to join their fleet is this hard-working Mack.**




**HANDLES LOADS WEIGHING 26,000 LBS.–72" WIDE**

•

**SPEEDS HANDLING OF BILLETS, BARS, IN-PROCESS AND FINISHED MATERIALS**

•

**HUGE 14.00-20 TIRES, PLENTY OF WEIGHT ON DRIVING WHEELS–MINIMUM YARD SURFACING REQUIRED**

•

**TAKES TOUGHEST OPERATING CONDITIONS IN STRIDE**

•

You'll want full details on this giant fork truck . . . designed to further speed mass handling of heavy materials and reduce costs even more. Write today.

Rely On ROSS

**THE ROSS CARRIER COMPANY**

*Direct Factory Branches and Distributors Throughout the World*

425 Miller St., Benton Harbor, Michigan, U. S. A.


# *new equipment*

*Continued from Page 3*

## Ceramic strainer core

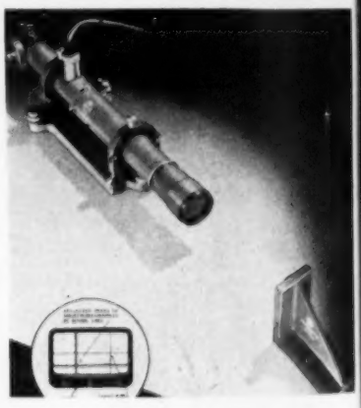
A new foundry ceramic strainer core fits into the gate of the mold and strains the molten metal as it flows through the holes of the strainer core. Castings are reportedly more evenly poured and are slag free. Machine-made under high pressures, the strainer cores are fired to temperatures above 2400° F. Core holes remain round and uniform during the pouring operation. Strainer cores are available in eight sizes. *American Clay Forming Co.*

**For more data insert No. 12 on postcard, p. 31**

## Manifold connection

To overcome the effects of increasingly high temperatures in jet engines, a new stainless steel flexible fuel oil manifold connection employs bellows as the flexible element. The bellows is welded to the fuel oil tubing and then covered with a metallic braid to give mechanical protection to the assembly. All welding is by the atomic hydrogen or inert arc methods. *Clifford Mfg. Co.*

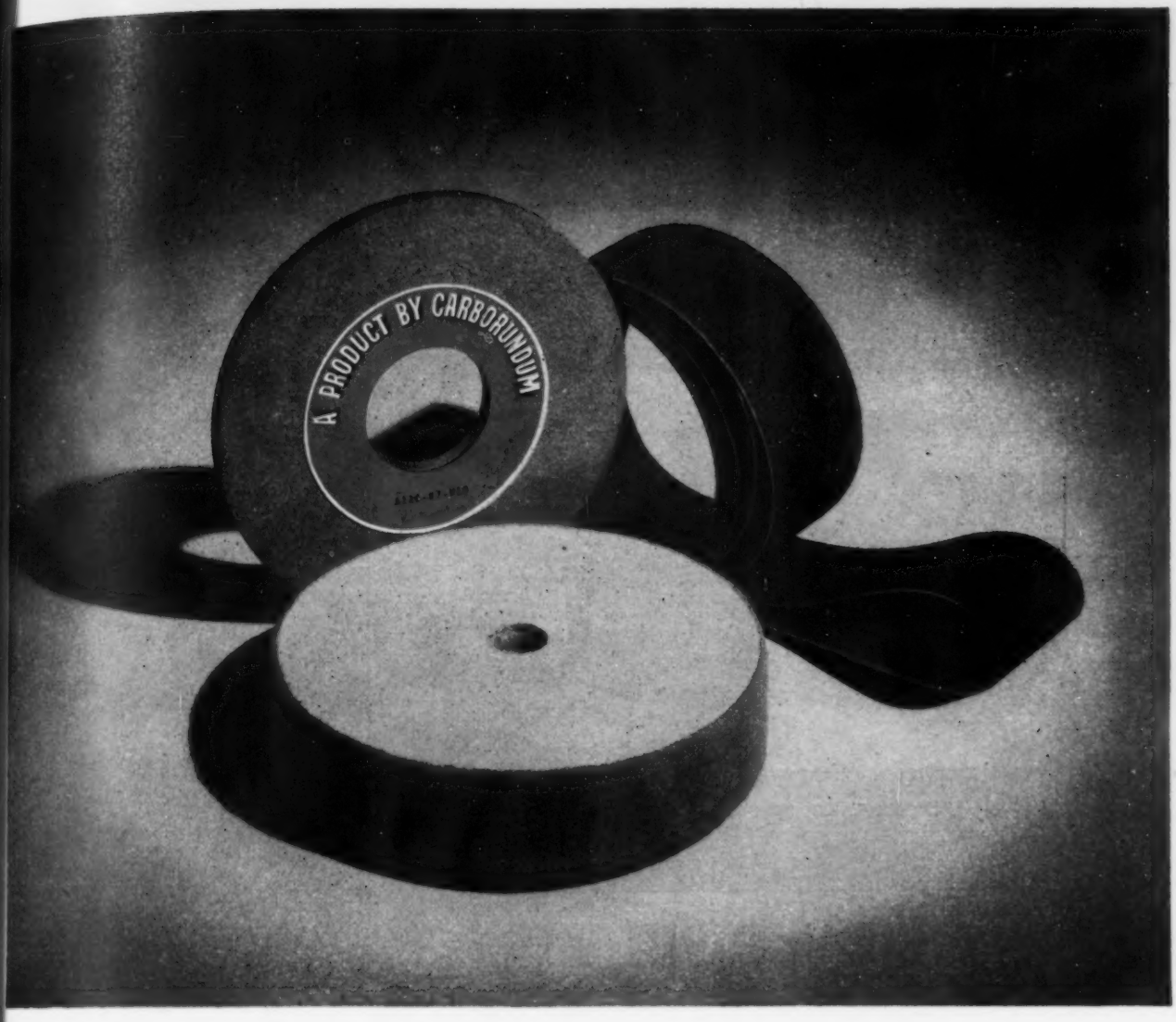
**For more data insert No. 13 on postcard, p. 31**



## Microptic auto-collimator

For gage and fixture inspection in the machine tool industry, and for the testing of precision mechanisms, an auto-collimator determines and checks straightness, squareness, and inclinations to one-half second of arc (0.0000025 in. per in. of length). It operates upon the optical principle that a beam of light reflected by a mirror is de-

*Turn to Page 110*




# You can't miss...

Not when you pick a product by CARBORUNDUM. A complete line of all abrasive products is your assurance of selective product application. You match the best method with the right product from the complete standard line by CARBORUNDUM.

Thus, the recommendation of an experienced CARBORUNDUM salesman or distributor is not merely helpful...it's impartial. These men have no reason to offer anything but the best method and product for your job...they sell the only complete line of products identified by the best known name in abrasives.

This experience in all abrasive products and methods is an excellent proving ground for new products and methods. Ask your CARBORUNDUM representative about them. You can't miss.

## *Only* CARBORUNDUM

TRADE MARK

***makes ALL Abrasive Products... to give you the proper ONE***

*"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, N.Y.*

# Direct Line to Production Savings

KEYSTONE

## TUBULAR RIVET WIRE

The special techniques and processing methods developed by Keystone have produced a tubular rivet wire with *exceptional* forming qualities for both extruded and drilled rivets.

The wire for drilled tubular rivets has the proper hardness for longer drill life. The wire for extruded rivets has uniform metal flow qualities required in extrusion headers. Both types have exactly the right ductility for cold heading and excellent roll crimping.

**MARKET *YOUR* SCRAP NOW!**

*Houseclean your plant for all worn out and obsolete equipment. Sell it to your local scrap dealer now in order to keep America's steel production expanding.*

**KEYSTONE**
**STEEL & WIRE CO.**

SPECIAL ANALYSIS WIRE. SETTING NEW STANDARDS OF PERFORMANCE

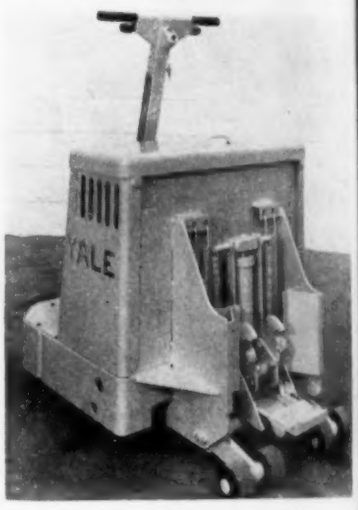
**PEORIA ILLINOIS**


# *new equipment*

*Continued from Page 106*

flected if the mirror is tilted and that the angle through which the reflected beam is turned is twice the angle of tilt of the mirror. Through the micrometer eyepiece of the instrument a reflected image of reference lines can be observed by which tilt is determind to an accuracy of a fraction of a second of arc. A yellow filter and convenient scale provide for precise and comfortable reading. *Engis Equipment Co.*

**For more data insert No. 14 on postcard, p. 35**




## *Motorized tractor*

A new motorized tractor that automatically engages various types of industrial trailers will permit operation in very narrow aisles and accurate spotting of loaded trailers. Called the Grip-Tow, the device is driven to the end of the trailer and a pushbutton is pressed engaging a hook on the tractor with the lower side of the trailer frame. The hook then pulls the trailer into intimate contact with the tractor. A pair of secondary hooks reach out and grab the top part of the trailer frame firmly engaging tractor and trailer. The trailing wheels of the tractor lift off the floor making trailer an integral part of the tractor. The Grip-Tow tractor will operate with almost any caster type trailer that has some projection of edge which the gripping mechanism can engage. *Yale & Towne Mfg. Co.*

**For more data insert No. 15 on postcard, p. 35**

***Turn to Page 114***

# JOHNSON'S WAX LUBRICANTS perform "impossible" draws!

Because of their ability to "stay with" the metal on which they are applied, Johnson's Wax Lubricants for drawing and forming metal offer results unobtainable with conventional lubricants.

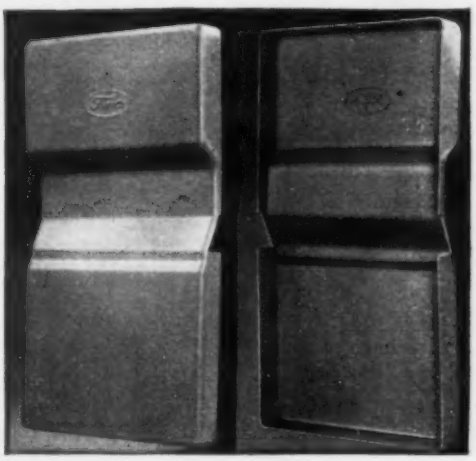
Under high heat and pressure conditions they permit unhampered flow of the metal during the draw to produce smooth, gall-free surfaces and perfect angles, corners and curves.

Johnson's Wax Lubricants are unmatched for drawing, stretch forming, bending, reducing, swaging, coining and lamination stamping. *We can prove it on your job.*

## Get these benefits now!

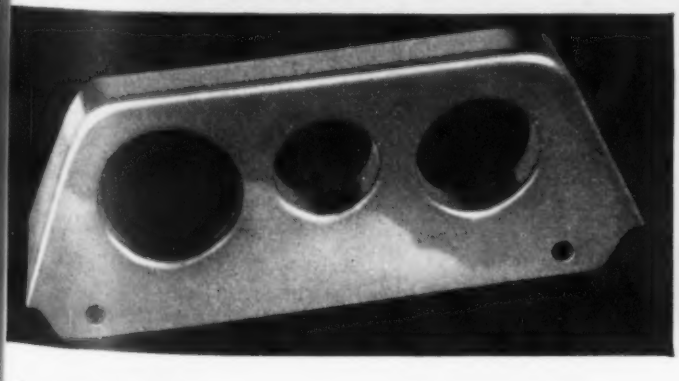
- Multiple draws without reapplication
- Far greater die life
- Excellent results on deep, hot, difficult draws
- Suitable for nearly any draw in the shop
- Easy application by conventional methods
- Clean, safer machine and shop surroundings
- Reduced press pressures—increased pad pressures where desired
- Substantial cost savings

*Above, Johnson's Wax Lubricant used for lamination stamping increased sets per die grind from 45,000 to 65,000.*



*Right, Car radio case of hot rolled steel—impossible to draw with common lubricants—perfect consecutive draws with Johnson's Wax Lubricant.*

*Below, Telephone coin receptacle of No. 405 stainless steel drawn with Johnson's Wax Lubricant. No perceptible tool wear after thousands of successive perfect draws.*



Write for complete information concerning the use of Johnson's Wax Lubricants for your particular job.

**S. C. JOHNSON & SON, INC.**
Industrial Products Dept. IA-8
Racine, Wisconsin

"LOOK HOW RUDOLPH'S OUTPUT HAS INCREASED SINCE THEY CHANGED TO THE RIGHT CUTTING FLUID!"

THE BEST MACHINE and the finest operator cannot do the best work without that irreplaceable essential — the *right* cutting fluid. Seldom is there more than one cutting fluid that is exactly *right* for the job — with which it may be done faster and better, or both.

Stuart combines theory and practice to give you the right cutting fluid for the job. Here is an example:

In a large gear department, cutting fluid tests were run on Gleason Revacycles cutting 8620 gear stock, 179 Brinnel hardness.

| | "X" Oil | Stuart's SPEEDKUT "A" |
|---|---|---|
| Gears Per Tool Grind..... | 1200 | 3200 |
| Stock Removal to Recondition Cutters ..... | .009" | .0035" |
| Price of Cutting Oil..... | 33c/gal. | 35c/gal. |

There's a story! More production because of less downtime. Longer cutter life because of fewer grinds and less stock removal per grind. A lower *actual cost* for the cutting fluid.

You can get help like this from a Stuart Representative. Ask to have him call.

*Are you receiving Stuart's Shop Notebook regularly?*
*Write, wire or phone*

GET MORE PRODUCTION
Use The Right Cutting Fluid

STUART SERVICE
*Goes with every Barrel*
*Offices in Principal Industrial Centers*

D.A. Stuart Oil CO.
2737 S. Troy St., Chicago 23, Illinois

# *new equipment*

*Continued from Page 110*

## *Two-speed drill*

A two-speed gear box of new design permits the operator of a new Desoutter drill to put through a small pilot hole first, then easily open out the hole with the larger drill. Changing speed from high to low and back is quickly and easily accomplished by pressing and turning the change speed control button. *Newage International, Inc.*

**For more data insert No. 16 on postcard, p. 35**

## *Low-cost powered sweeper*

A new sweeper is designed as an attachment to fit any fork lift truck up to 1500 lb capacity. The sweeper, operated by the lift truck operator, can clean indoors and out, as rapidly as 80,000 sq ft per hr, with the truck traveling 5 mph. This Yard Bird has its own self-contained spray system for dust control. The sweeper is the pick-up type, with brush whisking dirt and refuse into a full-width floating dust pan. *Little Giant Products, Inc.*

**For more data insert No. 17 on postcard, p. 35**

## *Safety goggle pliers*

Two new safety goggle pliers simplify and speed up the replacing of side-shields on spectacle type safety goggles. The pliers, both rivet knockout and riveting, are so designed that inserting or removing goggle rivets can be accomplished without removing lenses, and in just a few seconds. *American Optical Co.*

**For more data insert No. 18 on postcard, p. 35**

## *New stock sizes*

One hundred fifty-seven new stock sizes of Bost-Bronze oil impregnated porous bronze bearings include cylindrical, flange and thrust bearings, cored bar, solid bar and plate stock. Bost-Bronze bearings are interchangeable with solid bronze bearings. Having an oil film to start on as well as to run on they operate quietly and give long service. *Boston Gear Works*

**For more data insert No. 19 on postcard p. 35**

***Resume Your Reading on Page 39***

# IRON AGE *markets and prices*

*market briefs and bulletins*

**gas ban talk** — Petroleum Administration for Defense officials, feeling that the revised Defense Production Act does not prohibit the proposed natural gas ban, are planning to reopen discussion on the draft. A decision may be made soon. The order would exempt most states West of the Mississippi and some eastern areas already using natural gas. States certifying their own gas control may nullify certain terms of the ban.

**coal for power** — Electric utilities will consume more coal this year than ever before. Government utilities experts base their forecast on the fact that coal consumption by power companies was up 7.3 pct in the first 9 months of 1951 over the 1948 record. Demand for coal by utilities is expected to be exceptionally heavy in the last 3 months this year.

**need more pig tin** —Government allocations of pig tin to tinplate manufacturers must be increased if foreign requirements for tinplate are to be met, industry representatives told National Production Authority. Permitting production of about 120,000 tons of tinplate in the third quarter, allocations fall 5000 tons short of the goal. The deficit will be taken out of foreign quotas.

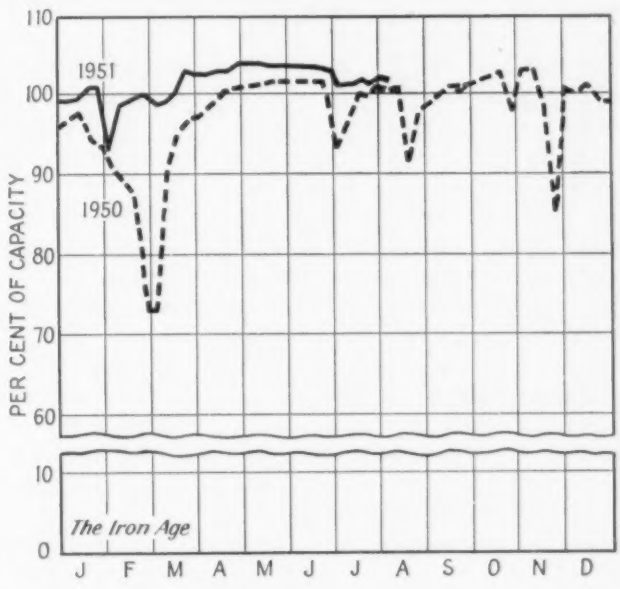
**cut ingot prices**—Reflecting a rollback in tin containing scrap ceilings, ingot makers have reduced prices by ½¢ to 14¢ per lb on brass ingots with tin content. Principally affected were 88-10-2 and 80-10-10 grades. Other grades were not changed but Office of Price Stabilization is reported to be considering definite ceilings on all secondary ingot alloys.

**study tax writeoffs**—The House Ways and Means Subcommittee is trying to learn if the rapid tax amortization program is losing the government any money. Treasury Dept. anticipates a loss of $4 billion to $5 billion over the next 5 years. Already approved are $5.9 billion worth of fast write-off certificates.

**kyanite imports** —Since foreign buyers can pay better prices for kyanite and mullite from India, imports of these commodities for the refractory industry are being slowed up. Shipments of kyanite in the first 5 months of 1951 have been a little higher than the same period last year, but National Production Authority expects a decline. Kyanite with a 60 pct aluminum content is needed in the U. S. for a superior refractory product. India sells on a first-come-first-served basis.

**magnesium** — Castalloy Co., Inc., has reactivated its magnesium and heat-treated aluminum foundry facilities at Everett, Mass. The plant is back in production, making aircraft and ordnance castings as it did in World War II.

**Steel Operations †**




**District Operating Rates—Per Cent of Capacity †**

| Week of | Pittsburgh | Chicago | Youngstown | Philadelphia | West | Buffalo | Cleveland | Detroit | Wheeling | South | Ohio River | St. Louis | East | Aggregate |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| July 29 | 96.0* | 102.5* | 103.0* | 101.0 | 105.0 | 104.0 | 99.0* | 101.0* | 105.0* | 99.0 | 101.0 | 95.5 | 111.0 | 101.5* |
| Aug. 5 | 99.0 | 105.0 | 103.0 | 101.0 | 104.0 | 104.0 | 99.0 | 106.0 | 105.0 | 111.0 | 93.5 | 90.5 | 106.0 | 101.5 |

† Beginning Jan. 1, 1951, operations are based on annual capacity of 104,229,650 net tons.
* Revised.

# nonferrous metals

*outlook and market activities*

## NONFERROUS METAL PRICES

| | Aug. 1 | Aug. 2 | Aug. 3 | Aug. 4 | Aug. 6 | Aug. 7 |
|---|---|---|---|---|---|---|
| Copper, electro, Conn. | 24.50 | 24.50 | 24.50 | 24.50 | 24.50 | 24.50 |
| Copper, Lake delivered | 24.625 | 24.625 | 24.625 | 24.625 | 24.625 | 24.625 |
| Tin, Straits, New York | $1.03 | $1.03 | $1.03 | .... | $1.03 | $1.03* |
| Zinc, East St. Louis | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 | 17.50 |
| Lead, St. Louis | 16.80 | 16.80 | 16.80 | 16.80 | 16.80 | 16.80 |

*Tentative

Note: Quotations are going prices.

*by R.Hatschek*

**RFC Cuts Tin Price 3¢**—As had been expected, Reconstruction Finance Corp. knocked 3¢ off the price of tin on Aug. 1 bringing the metal down to $1.03 per lb. The government also has a sort of trial contract, reported to be of 30-day duration, with Bolivia for tin at $1.12 and the Bolivian tin producers are not exactly happy about the latest RFC cut. They claim the new price is lower than production costs and state that they will not export "a single gram" of the metal to the U. S. at this price.

The continued price cutting by RFC has had its effect on the Singapore market as well and that price dropped to slightly better than 99¢ per lb on Saturday. This means a New York equivalent of about $1.02½. It gets to be a down-hill spiral with RFC taking the cue to drop prices whenever Singapore falls below RFC's quotation and then Singapore comes down to about the same level. Actually the Far East market took other ups and downs which prevented a smooth spiral.

**OPS Also Cuts Price**—Reflecting the continual dropping in tin prices, Office of Price Stabilization last week amended Ceiling Price Regulations 46 and 47. The amendments roll back prices on copper alloy and brass mill scrap containing tin. Old figures were based on $1.50 tin and new ones use $1.15 as a basis, keeping it high in the hope that it will not require changing too soon. Effective date was Aug. 6.

It has been reported that since these orders are now straightened out, OPS is at work with brass and bronze ingot makers to establish definite ceilings for their products. No details were available at press time. Ingot makers also suggested to National Production Authority that scrap premium quantities be cut down, that groups 1 and 2 be combined for quantity and that foundry scrap preparation premiums be reduced.

**Adjust Remelt Zinc**—OPS also slapped ceilings on remelted zinc in order to bring it into line with prices fixed on zinc scrap on June 1. New prices are 17.25¢ per lb for material containing at least 97½ pct zinc and 12.25¢ for material with less than 97½ pct zinc. OPS wants the ultimate consumer to benefit from the scrap rollback.

**Scrap Business Slow** — Metals scrap dealers report continued slow conditions. Here in the East virtually all sources of metals were cleaned out during the high price period when everyone knew that prices were going to be cut. As a result, there is very little scrap available and prices are not high enough to give collectors an adequate shove to get them out looking in odd corners.

**Strikes Over, But** — Aluminum Co. of America's forging plant at Cleveland is back in operation as a result of the ratification by union members of the agreement between union officials and the company. Workers of American Smelting and Refining Co.'s Garfield smelter have also voted to end their strike. This followed President Truman's request and differences are now being ironed out in Washington.

However, the strike picture in copper is not yet bright. A strike of 80,000 nonferrous metal mine workers throughout the nation is looming as a strike vote was scheduled for yesterday. Main issue in this case is wages. The Ansonia plant of the American Brass Co. is also slated for a strike vote tomorrow and the Torrington and Buffalo works of the company may also be affected.

**May Drop Lead Tariff** — The House Ways and Means Committee has voted to back a bill which would suspend the lead import duty until Mar. 31, 1953, or the end of the national emergency. Another provision is that the tariff would be reinstated whenever the lead price dropped below 16 7/8¢ per lb, similar to the copper tariff suspension now in effect.

## MILL PRODUCTS

*nts per lb, unless otherwise noted)*

### Aluminum

*ase 30,000 lb, f.o.b. ship. pt. frt. allowed)*

**Flat Sheet:** 0.188 in., 2S, 3S, 30.1¢; 4S, 32¢; 52S, 34.1¢; 24S-O, 24S-OAL, 32.9¢; -O, 75S-OAL, 39.9¢; 0.081 in., 2S, 3S, 31.2¢; 61S-O, 33.5¢; 52S, 35.6¢; 24S-O, 24S-OAL, 75S-O, 75S-OAL, 41.8¢; 0.032 in., 2S, 3S, 4S, 61S-O, 37.1¢; 52S, 39.8¢; 24S-O, OAL, 41.7¢; 75S-O, 75S-OAL, 52.2¢.

**Plate** ¼ in. and heavier: 2S, 3S-F, 28.3¢; F, 30.2¢; 52S-F, 31.8¢; 61S-O, 30.8¢; 24S-O, OAL, 32.4¢; 75S-O, 75S-OAL, 38.8¢.

**Extruded Solid Shapes:** Shape factors 1 to 5, 2¢ to 74.5¢; 12 to 14, 36.9¢ to 89¢; 24 to 89.6¢ to $1.16; 36 to 38, 47.2¢ to $1.70.

**Rod, Rolled:** 1.5 to 4.5 in., 2S-F, 3S-F, 37.5¢; 33.5¢; cold finished, 0.375 to 3 in., 2S-F, F, 40.5¢ to 35¢.

**Screw Machine Stock:** Rounds, 11S-T3, ⅛ 1/32 in., 53.5¢ to 42¢; ⅜ to 1½ in., 41.5¢ 39¢; 1 9/16 to 3 in., 38.5¢ to 36¢; 17S-T4 er by 1.5¢ per lb. Base 5000 lb.

**Drawn Wire:** Coiled, 0.051 to 0.374 in., 2S, ¢ to 29¢; 52S, 48¢ to 35¢; 56S, 51¢ to ; 17S-T4, 54¢ to 37.5¢; 61S-T4, 48.5¢ to ; 75S-T6, 84¢ to 67.5¢.

**Extruded Tubing, Rounds:** 63-S-T-5, OD in 1¼ to 2, 37¢ to 54¢; 2 to 4, 33.5¢ to 45.5¢; 6, 34¢ to 41.5¢; 6 to 9, 34.5¢ to 43.5¢.

**Roofing Sheet, Flat:** 0.019 in. x 28 in. per et, 72 in., $1.42; 96 in., $1.522; 120 in., 02; 144 in., $2.284. Gage 0.24 x 28 in., in., $1.379; 96 in., $1.839; 120 in., $2.299; in., $2.759. Coiled Sheet: 0.019 in. x 28 in., ¢ per lb; 0.024 in. x 28 in., 26.9¢ lb.

### Magnesium

*(F.O.B. mill, freight allowed)*

**Sheet and Plate:** FS1-O, ¼ in., 63¢; 3/16 in. ; ⅛ in. 67¢; B & S Gage 10, 68¢; 12, 72¢; 78¢; 16, 85¢; 18, 93¢; 20, $1.05; 22, $1.27; $1.67. Specification grade higher. Base: 00 lb.

**Extruded Round Rod:** M, diam in., ¼ to 1 in., 74¢; ½ to ¾ in., 57.5¢; 1¼ to 1.749 53¢; 2½ to 5 in., 48.5¢. Other alloys higher. e Up to ¾ in. diam, 10,000 lb; ⅞ to 2 20,000 lb; 2 in. and larger, 30,000 lb.

**Extruded Solid Shapes, Rectangles:** M. In ght per ft, for perimeters less than size icated, 0.10 to 0.11 lb, 3.5 in., 62.3¢ 0.22 0.25 lb, 5.9 in., 59.3¢ 0.50 to 0.59 lb, 8.6 56.7¢; 1.8 to 2.59 lb, 19.5 in., 53.8¢; 4 to , 28 in., 49¢. Other alloys higher. Base, in ght per ft of shape: Up to ½ lb, 10,000 ½ to 1.80 lb, 20,000 lb; 1.80 lb and heavier, 00 lb.

**Extruded Round Tubing:** M, wall thick- , outside diam, in., 0.049 to 0.057, ¼ in. 5/16, $1.40; 5/16 to ⅜, $1.26; ½ to ⅝, 1 to 2 in., 76¢; 0.165 to $0.219, ⅝ to 61¢; 1 to 2 in., 57¢; 3 to 4 in., 56¢. er alloys higher. Base, OD in in.: Up to in., 10,000 lb; 1½ in. to 3 in., 20,000 lb; n. and larger, 30,000 lb.

### Titanium

*(10,000 lb base, f.o.b. mill)*

Commercially pure and alloy grades: Sheet l strip, HR or CR, $15; Plate, HR, $12; re, rolled and/or drawn, $10; Bar, HR or ed, $6; Forgings, $6.

### Nickel and Monel

*(Base prices, f.o.b., mill)*

| | "A" Nickel | Monel |
|---|---|---|
| eets, cold rolled | 77 | 60½ |
| ip, cold-rolled | 83 | 63½ |
| ds and bars | 73 | 58½ |
| gles, hot-rolled | 73 | 58½ |
| ates | 75 | 59½ |
| amless tubes | 106 | 93½ |
| ot and blocks | .. | 53½ |

### Copper, Brass, Bronze

*(Freight prepaid on 200 lb)*

| | Sheet | Rods | Extruded Shapes |
|---|---|---|---|
| pper | 40.18 | .... | 39.78 |
| pper, h-r | .... | 36.03 | .... |
| pper, drawn | .... | 37.28 | .... |
| w brass | 38.47 | 38.16 | .... |
| llow brass | 37.28 | 36.97 | .... |
| d brass | 38.86 | 38.55 | .... |
| val brass | 42.27 | 36.33 | 37.59 |
| nded brass | .... | .... | 35.86 |
| n'l bronze | 40.18 | 39.87 | .... |
| ng. bronze | 45.77 | 39.80 | 41.36 |
| os. bronze | 59.42 | 59.67 | .... |
| ntz metal | 40.28 | 35.84 | 37.09 |
| silver, 10 pct | 48.26 | 50.59 | .... |

## PRIMARY METALS

*(Cents per lb, unless otherwise noted)*

| | |
|---|---|
| Aluminum ingot, 99+%, 10,000 lb, freight allowed | 19.00 |
| Aluminum pig | 18.00 |
| Antimony, American, Laredo, Tex. | 42.00 |
| Beryllium copper, 3.75-4.25% Be | $1.56 |
| Beryllium aluminum 5% Be, Dollars per lb contained Be | $69.00 |
| Bismuth, ton lots | $2.25 |
| Cadmium, del'd | $2.55 |
| Cobalt, 97-99% (per lb) | $2.10 to $2.17 |
| Copper, electro, Conn. Valley | 24.50 |
| Copper, Lake, delivered | 24.625 |
| Gold, U. S. Treas., dollars per oz. | $35.00 |
| Indium, 99.8%, dollars per troy oz. | $2.25 |
| Iridium, dollars per troy oz. | $200 |
| Lead, St. Louis | 16.80 |
| Lead, New York | 17.00 |
| Magnesium, 99.8+%, f.o.b. Freeport, Tex., 10,000 lb | 24.50 |
| Magnesium, sticks, 100 to 500 lb | 42.00 to 44.00 |
| Mercury, dollars per 76-lb flask, f.o.b. New York | $200-$205 |
| Nickel electro, f.o.b. N.Y. warehouse | 59.58 |
| Nickel oxide sinter, at Copper Cliff, Ont., contained nickel | 52.75 |
| Palladium, dollars per troy oz. | $24.00 |
| Platinum, dollars per troy oz. | $90 to $93 |
| Silver, New York, cents per oz. | 90.16 |
| Tin, New York | $1.03 |
| Titanium, sponge | $5.00 |
| Zinc, East St. Louis | 17.50 |
| Zinc, New York | 18.25 |
| Zirconium copper, 50 pct | $6.20 |

## REMELTED METALS

### Brass Ingot

*(Cents per lb, delivered carloads)*

| | |
|---|---|
| 85-5-5-5 ingot | |
| No. 115 | 29.00 |
| No. 120 | 28.50 |
| No. 123 | 28.00 |
| 80-10-10 ingot | |
| No. 305 | 34.00 |
| No. 315 | 32.00 |
| 88-10-2 ingot | |
| No. 210 | 40.00 |
| No. 215 | 38.50 |
| No. 245 | 37.00 |
| Yellow ingot | |
| No. 405 | 25.50 |
| Manganese bronze | |
| No. 421 | 32.75 |

### Aluminum Ingot

*(Cents per lb, 10,000 lb and over)*

| | |
|---|---|
| 95-5 aluminum-silicon alloys | |
| 0.30 copper, max. | 20.6 |
| 0.60 copper, max. | 20.4 |
| Piston alloys (No. 122 type) | 21.2 |
| No. 12 alum. (No. 2 grade) | 19.5 |
| 108 alloy | 20.6 |
| 195 alloy | 20.8 |
| 13 alloy | 20.8 |
| ASX-679 | 20.5 |

### Steel deoxidizing aluminum, notch-bar granulated or shot

| | |
|---|---|
| Grade 1—95-97½% | 18.00 |
| Grade 2—92-95% | 17.75 |
| Grade 3—90-92% | 17.25 |
| Grade 4—85-90% | 16.50 |

## ELECTROPLATING SUPPLIES

### Anodes

*(Cents per lb, freight allowed, 500 lb lots)*

| | |
|---|---|
| Copper | |
| Cast, oval, 15 in. or longer | 39½ |
| Electrodeposited | 33⅜ |
| Rolled, oval, straight, delivered | 38⅞ |
| Forged ball anodes | 43 |
| Brass, 80-20 | |
| Cast, oval, 15 in. or longer | 34¾ |
| Zinc, oval | 26½ |
| Ball anodes | 25½ |
| Nickel 99 pct plus | |
| Cast | 76.00 |
| Rolled, depolarized | 77.00 |
| Cadmium | $2.80 |
| Silver 999 fine, rolled, 100 oz lots, per troy oz, f.o.b. Bridgeport, Conn. | 97½ |

### Chemicals

*(Cents per lb, f.o.b. shipping points)*

| | |
|---|---|
| Copper cyanide, 100 lb drum | 63 |
| Copper sulfate, 99.5 crystals, bbl. | 12.85 |
| Nickel salts, single or double, 4-100 lb bags, frt. allowed | 20½ |
| Nickel chloride, 375 lb drum | 27½ |
| Silver cyanide, 100 oz lots, per oz | 67¼ |
| Sodium cyanide, 96 pct domestic 200 lb drums | 19.25 |
| Zinc cyanide, 100 lb drum | 47.7 |

## SCRAP METALS

### Brass Mill Scrap

*(Cents per pound, add ½¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)*

| | Heavy | Turnings |
|---|---|---|
| Copper | 21½ | 20¾ |
| Yellow Brass | 19⅛ | 17⅞ |
| Red brass | 20¼ | 19⅝ |
| Comm. bronze | 20½ | 19¾ |
| Mang. bronze | 18¾ | 18 |
| Brass rod ends | 18⅞ | .... |

### Custom Smelters' Scrap

*(Cents per pound, carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 19.25 |
| No. 2 copper wire | 17.75 |
| Light copper | 16.50 |
| Refinery brass | 17.25* |
| Radiators | 15.50 |

* Dry copper content.

### Ingot Makers' Scrap

*(Cents per pound, carload lots, delivered to refinery)*

| | |
|---|---|
| No. 1 copper wire | 19.25 |
| No. 2 copper wire | 17.75 |
| Light copper | 16.50 |
| No. 1 composition | 19.50 |
| No. 1 comp. turnings | 19.25 |
| Rolled brass | 15.50 |
| Brass pipe | 16.50 |
| Radiators | 15.50 |
| *Aluminum* | |
| Mixed old cast | 9.75 |
| Mixed new clips | 11.00 |
| Mixed turnings, dry | 9.50 |
| Pots and pans | 9.25 |

### Dealers' Scrap

*(Dealers' buying prices, f.o.b. New York in cents per pound)*

#### Copper and Brass

| | |
|---|---|
| No. 1 heavy copper and wire | 18¾—19¼ |
| No. 2 heavy copper and wire | 17¼—17¾ |
| Light copper | 16 —16½ |
| New type shell cuttings | 16 —16½ |
| Auto radiators (unsweated) | 15 —15½ |
| No. 1 composition | 19 —19½ |
| No. 1 composition turnings | 18¾—19¼ |
| Unlined red car boxes | 17¾—18¼ |
| Cocks and faucets | 16¼—16¾ |
| Mixed heavy yellow brass | 13½—14 |
| Old rolled brass | 15 —15½ |
| Brass pipe | 16 —16½ |
| New soft brass clippings | 16 —16½ |
| Brass rod ends | 17 —18 |
| No. 1 brass rod turnings | 16 —17 |

#### Aluminum

| | |
|---|---|
| Alum. pistons and struts | 7½— 8 |
| Aluminum crankcases | 7½— 8 |
| 2S aluminum clippings | 10½ |
| Old sheet and utensils | 7½— 8 |
| Borings and turnings | 5 — 6 |
| Misc. cast aluminum | 7½— 8 |
| Dural clips (24S) | 10 —11 |

#### Zinc

| | |
|---|---|
| New zinc clippings | 12¼—12½ |
| Old zinc | 9 — 9¼ |
| Zinc routings | 5¾— 6 |
| Old die cast scrap | 5¾— 6 |

#### Nickel and Monel

| | |
|---|---|
| Pure nickel clippings | 35 —36 |
| Clean nickel turnings | 35 —36 |
| Nickel anodes | 35 —36 |
| Nickel rod ends | 35 —36 |
| New Monel clippings | 28 —29 |
| Clean Monel turnings | 20 —21 |
| Old sheet Monel | 28 —29 |
| Nickel silver clippings, mixed | 13 —14 |
| Nickel silver turnings, mixed | 12 —13 |

#### Lead

| | |
|---|---|
| Soft scrap, lead | 14 —14⅛ |
| Battery plates (dry) | 9½—10 |

#### Magnesium

| | |
|---|---|
| Segregated solids | 15 —16 |
| Castings | 14 —15 |

#### Miscellaneous

| | |
|---|---|
| Block tin | 85 —90 |
| No. 1 pewter | 60 —65 |
| No. 1 auto babbitt | 48 —50 |
| Mixed common babbitt | 16¼—16⅛ |
| Solder joints | 23 —24 |
| Siphon tops | 48 —50 |
| Small foundry type | 20½—21 |
| Monotype | 18¼—18⅛ |
| Lino. and stereotype | 17½—18 |
| Electrotype | 15 —15⅛ |
| Hand picked type shells | 8¾— 9 |
| Lino. and stereo. dross | 8¾— 9 |
| Electro. dross | 5 — 5¼ |

# SCRAP *iron and steel*

*markets*
*prices*
*trends*

**Reason given for optimistic scrap estimate . . . Stockpiles still sick despite a few gains . . . May recover rails.**

A Pittsburgh source gives an explanation to the "over optimistic" estimates of scrap stockpiles by the government (THE IRON AGE, Aug 2, p. 138). It seems that the estimate for Pittsburgh — 1.97 months—included a pile of scrap that is being gathered for new openhearth capacity to come in later. The scrap is not immediately available for use.

Some producers find themselves in a better inventory position now than in July. The stockpile rise is by no means substantial but any improvement in the shortage market of today makes one take heart. There have been some reports that insistence of mills to brokers has lessened. Reason for this may be the hot weather.

Certainly scrap piles are in a sick condition when fall and winter production is considered. Mills and the scrap trade have made their plight known to every industry in the country with ads, publicity, National Production Authority and trade group literature. The trade is now waiting to reap a harvest of surplus scrap.

One report has it that scrap drives in industry and government departments will push up the scrap yield considerably. Whether the increase will be sufficient to stave off melting slowdowns still hangs in the balance. But one thing must be considered: scrap sources that traditionally closed up during the cold months will be pushed hard deep into winter. This may be borrowing from the future, as some put it, but defense mobilization makes no other course possible.

It is reported that foundries in the Cleveland area may be able to buy 2500 tons of trolley rails from the city on allocation from NPA.

**PITTSBURGH** — Inventory position of mills here has improved slightly. A large consumer who several months ago was down to a 2-day supply reports his stocks now are enough for 10 days' operation. A government estimate that mills here have inventories of close to 2 months is not realistic. Included in this estimate are the stocks of a large mill accumulating scrap for new openhearths which won't be in operation until late this year, if then. The cast market continues soft.

**CHICAGO**—The scrap outlook in the Chicago area remains clouded. Scrap inventories at the mills are the subject of much speculation as conflicting reports describe conditions here as "fair to low." Industrial scrap generation is off noticeably but is expected to pick up during the final 2 weeks of the month. Volume of railroad scrap has shrunk substantially as the amount of dismantling has been cut to very low levels.

**PHILADELPHIA** — Despite cooler weather, the mid-summer lethargy remains with the scrap market. Shipments and collections are generally fair on light scrap and poorer on heavy material. It is felt that most of the openhearth mills have been able to improve their inventory positions and purchasing agents are not breathing so heavily down their scrap brokers' necks. The cast market continues quite soft. Allocations of dealer scrap are being issued frequently.

**NEW YORK** — The summer market here held steady, maintaining last week's tone and pace. Shipments are considered normal for normal times. One medium-sized auto graveyard reports a little difficulty in getting rid of its cast iron but nevertheless manages. Influx of auto scrap is at the rate of previous years. The government's estimates of scrap stocks are generally ignored as unreal here.

**DETROIT**—The slip in auto production is showing already. The volume of bundles is off substantially. Several large plants are closed. Vacation shutdowns are expected to cut back still further the amount of scrap generated this month. About the only compensation is an apparent increase in the amount of turnings coming into dealers' yards.

**CLEVELAND** — Scrap situation here continues dismal. This area may perhaps be the worst off of any. Foundries are receiving some rails, allocated from the West—but not quite enough. A large steel producer here is faced with a possible shutdown of a blast furnace for repairs. More scrap would then be needed for the openhearths to make up the deficit in hot metal. Where the extra scrap will come from is a mystery. One scrap dealer has lost over 4 days of burning and processing time as a result of the truck strike.

**BIRMINGHAM** — Openhearth users of scrap are all hitting the allocations list. Cast is feeble. Two pipe producers are down on strikes and other cast users have gathered large inventories. One large consumer withdrew from the market. Overall scrap flow is considered normal for this hot part of the year.

**CINCINNATI** — Dealers here are still able to meet foundry demands for rail. Requirements for openhearth grades are being met but with practically all on allocation. Scrap dealers are "beating the bushes" trying to locate new sources of scrap, but with little success. Many of these mills are still operating on 2 to 3 day inventories. The forecast is that most or all steel producers in the area will have to cut production this winter.

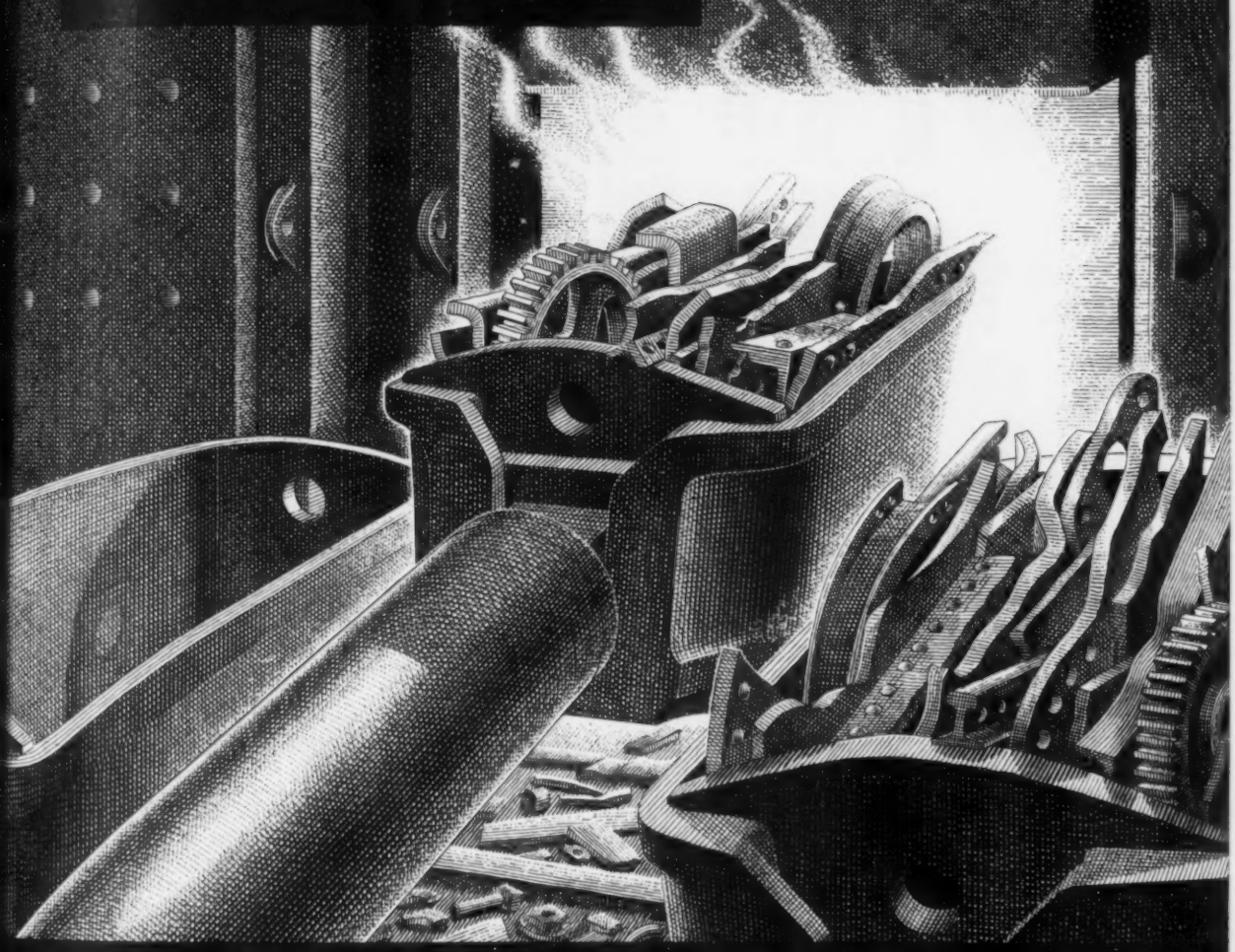
**BOSTON**—Activity in this area continues good. Scrap is moving and no one is holding back. The trade feels that Washington may have to make some price changes. Scrap drives are going into full swing.

**ST. LOUIS** — Although flood waters have subsided in the St. Louis area, there has been no improvement in the movement of scrap iron to this market. There is still work to be done in cleaning up the debris. Hot weather, too, is a factor in holding down collection of scrap. Yards along the Mississippi River front here have resumed operations after removing mud and dirt. Steel mills are in a fairly good position as a result of shipments on allocations made before the floods, but more is needed.

**BUFFALO**—Two of the three leading mills here made sizeable additions to scrap stockpiles last week. About 15,000 tons arrived by water from the eastern coast. Mid-state areas shipped substantial quantities. Scrap quality was reported only fair with some rejections.

# SCRAP *at your Service!*

The facilities and experienced personnel in each of our offices, stand ready to supply your every scrap requirement whenever and wherever needed.



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**LEADERS IN IRON AND STEEL SCRAP SINCE 1889**

Iron and Steel

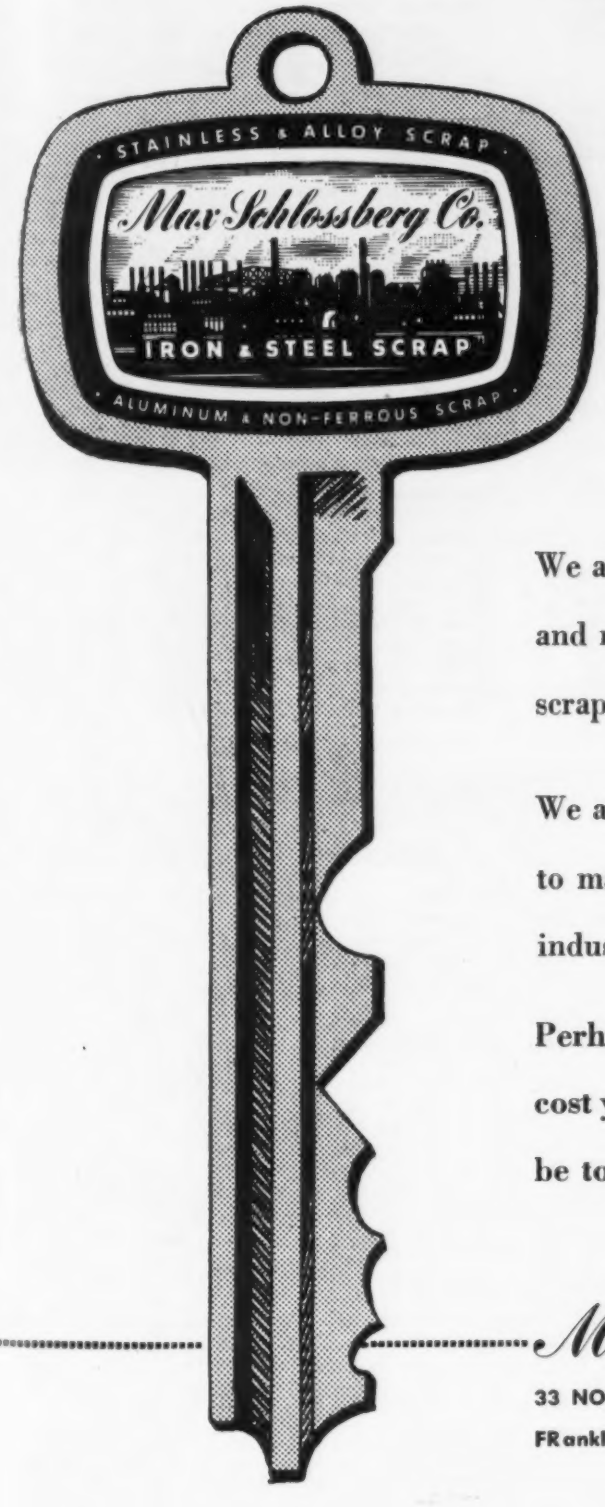
# SCRAP PRICES

(Maximum basing point prices, per gross ton, as set by OPS, effective Feb. 7, 1951. Shipping point and delivered prices calculated as shown below.)

| Switching Charge (Dollars per gross ton) → | | $0.99 | | |

# *The Key to . . .*

## *Service and Dependability*




We are brokers and dealers in ferrous and non-ferrous metals—both in scrap and semi-finished form.

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*Max Schlossberg Co.*

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# Comparison of Prices

**Steel prices in this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.**

| Flat-Rolled Steel: (cents per pound) | Aug. 7, 1951 | July 31, 1951 | July 10, 1951 | Aug. 8 1950 |
|---|---|---|---|---|
| Hot-rolled sheets | 3.60 | 3.60 | 3.60 | 3.35 |
| Cold-rolled sheets | 4.35 | 4.35 | 4.35 | 4.10 |
| Galvanized sheets (10 ga) | 4.80 | 4.80 | 4.80 | 4.40 |
| Hot-rolled strip | 3.50 | 3.50 | 3.50 | 3.25 |
| Cold-rolled strip | 4.75 | 4.75 | 4.75 | 4.21 |
| Plate | 3.70 | 3.70 | 3.70 | 3.50 |
| Plates wrought iron | 7.85 | 7.85 | 7.85 | 7.85 |
| Stains C-R strip (No. 302) | 36.75 | 36.75 | 36.75 | 33.00 |
| **Tin and Ternplate:** (dollars per base box) | | | | |
| Tinplate (1.50 lb.) cokes. | $8.70 | $8.70 | $8.70 | $7.50 |
| Tinplate, electro (0.50 lb.) | 7.40 | 7.40 | 7.40 | 6.60 |
| Special coated mfg. ternes | 7.50 | 7.50 | 7.50 | 6.35 |
| **Bars and Shapes:** (cents per pound) | | | | |
| Merchant bars | 3.70 | 3.70 | 3.70 | 3.45 |
| Cold finished bars | 4.55 | 4.55 | 4.55 | 4.145 |
| Alloy bars | 4.30 | 4.30 | 4.30 | 3.95 |
| Structural shapes | 3.65 | 3.65 | 3.65 | 3.40 |
| Stainless bars (No. 302) | 31.50 | 31.50 | 31.50 | 28.50 |
| Wrought iron bars | 9.50 | 9.50 | 9.50 | 9.50 |
| **Wire:** (cents per pound) | | | | |
| Bright wire | 4.85 | 4.85 | 4.85 | 4.50 |
| **Rails:** (dollars per 100 lb) | | | | |
| Heavy rails | $3.60 | $3.60 | $3.60 | $3.40 |
| Light rails | 4.00 | 4.00 | 4.00 | 3.75 |
| **Semifinished Steel:** (dollars per net ton) | | | | |
| Rerolling billets | $56.00 | $56.00 | $56.00 | $54.00 |
| Slabs, rerolling | 56.00 | 56.00 | 56.00 | 54.00 |
| Forging billets | 66.00 | 66.00 | 66.00 | 63.00 |
| Alloy blooms billets, slabs | 70.00 | 70.00 | 70.00 | 66.00 |
| **Wire Rod and Skelp:** (cents per pound) | | | | |
| Wire rods | 4.10 | 4.10 | 4.10 | 3.85 |
| Skelp | 3.35 | 3.35 | 3.35 | 3.15 |

**Price advances over previous week are printed in Heavy Type; declines appear in *Italics***

| Pig Iron: (per gross ton) | Aug. 7, 1951 | July 31, 1951 | July 10, 1951 | Aug. 9 1950 |
|---|---|---|---|---|
| No. 2 foundry, del'd Phila. | $57.77 | $57.77 | $57.77 | $51.76 |
| No. 2, Valley furnace | 52.50 | 52.50 | 52.50 | 46.50 |
| No. 2, Southern Cin'ti | 55.58 | 55.58 | 55.58 | 49.08 |
| No. 2, Birmingham | 48.88 | 48.88 | 48.88 | 42.38 |
| No. 2, foundry, Chicago† | 52.50 | 52.50 | 52.50 | 46.50 |
| Basic del'd Philadelphia | 56.92 | 56.92 | 56.92 | 50.92 |
| Basic, Valley furnace | 52.00 | 52.00 | 52.00 | 46.00 |
| Malleable, Chicago† | 52.50 | 52.50 | 52.50 | 46.50 |
| Malleable, Valley | 52.50 | 52.50 | 52.50 | 46.50 |
| Charcoal, Chicago | 70.56 | 70.56 | 70.56 | 68.56 |
| Ferromanganese‡ | 186.25 | 186.25 | 186.25 | 173.40 |

†The switching charge for delivery to foundries in the Chicago district is $1 per ton.
‡Average of U. S. prices quoted on Ferroalloy page.

| Scrap: (per gross ton) | | | | |
|---|---|---|---|---|
| No. 1 steel, Pittsburgh | $44.00* | $44.00* | $44.00* | $43.50 |
| No. 1 steel, Phila. area | 42.50* | 42.50* | 42.50* | 35.50 |
| No. 1 steel, Chicago | 42.50* | 42.50* | 42.50* | 38.50 |
| No. 1 bundles, Detroit | 41.15* | 41.15* | 41.15* | 38.50 |
| Low phos. Young'n | 46.50* | 46.50* | 46.50* | 45.75 |
| No. 1 cast, Pittsburgh | 49.00† | 49.00† | 49.00† | 44.75 |
| No. 1 cast, Philadelphia | 49.00† | 49.00† | 49.00† | 40.50 |
| No. 1 cast, Chicago | 49.00† | 49.00† | 49.00† | 47.50 |

*Basing Pt. †Shipping Pt.
Not including broker's fee after Feb. 7, 1951.

| Coke: Connellsville: (per net ton at oven) | | | | |
|---|---|---|---|---|
| Furnace coke, prompt | $14.75 | $14.75 | $14.75 | $14.25 |
| Foundry coke, prompt | 17.75 | 17.75 | 17.75 | 16.25 |
| **Nonferrous Metals:** (cents per pound to large buyers) | | | | |
| Copper, electro, Conn. | 24.50 | 24.50 | 24.50 | 22.50 |
| Copper, Lake, Conn. | 24.625 | 24.625 | 24.625 | 22.625 |
| Tin, Straits, New York | *$1.03*† | $1.06 | $1.06 | 99.25 |
| Zinc, East St. Louis | 17.50 | 17.50 | 17.50 | 15.00 |
| Lead, St. Louis | 16.80 | 16.80 | 16.80 | 11.80 |
| Aluminum, virgin | 19.00 | 19.00 | 19.00 | 17.50 |
| Nickel, electrolytic | 59.58 | 59.58 | 59.58 | 51.22 |
| Magnesium, ingot | 24.50 | 24.50 | 24.50 | 22.50 |
| Antimony, Laredo, Tex. | 42.00 | 42.00 | 42.00 | 24.50 |

†Tentative. •Revised.

# Composite Prices

**Starting with the issue of May 12, 1949, the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive. (See p. 130 of May 12, 1949, issue.)**

| | Finished Steel Base Price | Pig Iron | Scrap Steel |
|---|---|---|---|
| Aug. 7, 1951 | 4.131¢ per lb. | $52.69 per gross ton | $43.00 per gross ton |
| One week ago | 4.131¢ per lb. | 52.69 per gross ton | 43.00 per gross ton |
| One month ago | 4.131¢ per lb. | 52.69 per gross ton | 43.00 per gross ton |
| One year ago | 3.837¢ per lb. | 46.61 per gross ton | 39.17 per gross ton |

| | Finished Steel Base Price High | Finished Steel Base Price Low | Pig Iron High | Pig Iron Low | Scrap Steel High | Scrap Steel Low |
|---|---|---|---|---|---|---|
| 1951 | 4.131¢ Jan. 2 | 4.131¢ Jan. 2 | $52.69 Jan. 2 | $52.69 Jan. 2 | $47.75 Jan. 30 | $43.00 Feb. 7 |
| 1950 | 4.131¢ Dec. 1 | 3.837¢ Jan. 3 | 52.69 Dec. 12 | 45.88 Jan. 3 | 45.13 Dec. 19 | 26.25 Jan. 3 |
| 1949 | 3.837¢ Dec. 27 | 3.3705¢ May 3 | 46.87 Jan. 18 | 45.88 Sept. 6 | 43.00 Jan. 4 | 19.33 June 28 |
| 1948 | 3.721¢ July 27 | 3.193¢ Jan. 1 | 46.91 Oct. 12 | 39.58 Jan. 6 | 43.16 July 27 | 39.75 Mar. 9 |
| 1947 | 3.193¢ July 29 | 2.848¢ Jan. 1 | 37.98 Dec. 30 | 30.14 Jan. 7 | 42.58 Oct. 28 | 29.50 May 20 |
| 1946 | 2.848¢ Dec. 31 | 2.464¢ Jan. 1 | 30.14 Dec. 10 | 25.37 Jan. 1 | 31.17 Dec. 24 | 19.17 Jan. 1 |
| 1945 | 2.464¢ May 29 | 2.396¢ Jan. 1 | 25.37 Oct. 23 | 23.61 Jan. 2 | 19.17 Jan. 2 | 18.92 May 22 |
| 1944 | 2.396¢ | 2.396¢ | $23.61 | $23.61 | 19.17 Jan. 11 | 15.76 Oct. 24 |
| 1943 | 2.396¢ | 2.396¢ | 23.61 | 23.61 | $19.17 | $19.17 |
| 1942 | 2.396¢ | 2.396¢ | 23.61 | 23.61 | 19.17 | 19.17 |
| 1941 | 2.396¢ | 2.396¢ | $23.61 Mar. 20 | $23.45 Jan. 2 | $22.00 Jan. 7 | $19.17 Apr. 10 |
| 1940 | 2.30467¢ Jan. 2 | 2.24107¢ Apr. 16 | 23.45 Dec. 23 | 22.61 Jan. 2 | 21.83 Dec. 30 | 16.04 Apr. 9 |
| 1939 | 2.35367¢ Jan. 3 | 2.26689¢ May 16 | 22.61 Sept. 19 | 20.61 Sept. 12 | 22.50 Oct. 3 | 14.08 May 16 |
| 1938 | 2.58414¢ Jan. 4 | 2.27207¢ Oct. 18 | 23.25 June 21 | 19.61 July 6 | 15.00 Nov. 22 | 11.00 June 7 |
| 1937 | 2.58414¢ Mar. 9 | 2.32263¢ Jan. 4 | 32.25 Mar. 9 | 20.25 Feb. 16 | 21.92 Mar. 30 | 12.67 June 9 |
| 1936 | 2.32263¢ Dec. 28 | 2.05200¢ Mar. 10 | 19.74 Nov. 24 | 18.73 Aug. 11 | 17.75 Dec. 21 | 12.67 June 8 |
| 1932 | 1.89196¢ July 5 | 1.83910¢ Mar. 1 | 14.81 Jan. 5 | 13.56 Dec. 6 | 8.50 Jan. 12 | 6.43 July 5 |
| 1929 | 2.31773¢ May 28 | 2.26498¢ Oct. 29 | 18.71 May 14 | 18.21 Dec. 17 | 17.58 Jan. 29 | 14.08 Dec. 8 |

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strips, representing major portion of finished steel shipment. Index recapitulated in Aug. 18, 1941, issue and in May 12, 1949.

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

Average of No. 1 heavy melting steel scrap delivered to consumers at Pittsburgh, Philadelphia and Chicago.

# An Important Message On CMP

It has come to our attention that some steel consumers, particularly those concerned with "B" products, have been requesting allotments from their steel suppliers or passing on to them their allotment authorizations. This is contrary to CMP regulations, and seriously delays the entire allotment procedure for you.

Therefore, in an effort to help clarify this situation, we have briefly indicated below the general procedure which should be followed in securing an allotment.

We would like to emphasize that steel warehouse distributors are not involved with the handling or issuance of allotments. When placing an order with your steel supplier, simply show your allotment number and the quarter for which the allotment is valid (Example: K-2-4Q51). Orders must also be properly certified under CMP regulations.

## The General Requirements For Obtaining An Allotment

### CLASS "A" PRODUCERS

**1.** If you are a producer of a class "A" product, you will get your allotments for controlled materials from the claimant agency (governmental), prime consumer (seller to claimant agency), or secondary consumer (seller to prime consumer) to whom you sell your product. IN EACH CASE, GO DIRECTLY TO YOUR OWN CUSTOMER FOR AN ALLOTMENT.

**2.** Your allotment application (Form CMP-4A) must include the amounts of controlled materials needed by your sub-contractors as well as by you.

**3.** You need not apply for controlled materials used for class "B" products to be incorporated in your class "A" product, since producers of class "B" products will receive their allotments direct from the NPA.

### CLASS "B" PRODUCERS

**1.** If you are a producer of a class "B" product your application for controlled materials on Form CMP-4B must be sent to the proper industry division of NPA. You cannot obtain an allotment from any other source.

**2.** Your application Form CMP-4B must show all the controlled materials you need, as well as controlled materials needed by your sub-contractors producing class "A" products to be incorporated in your class "B" product.

## UNITED STATES STEEL SUPPLY COMPANY

***Warehouses Coast to Coast***

BALTIMORE · BOSTON · CHICAGO · CLEVELAND · LOS ANGELES · MILWAUKEE · MOLINE, ILL. · NEWARK
PITTSBURGH · PORTLAND, ORE. · ST. LOUIS · TWIN CITY (ST. PAUL) · SAN FRANCISCO · SEATTLE

Sales Offices: INDIANAPOLIS · KANSAS CITY, MO. · PHILADELPHIA · PHOENIX · ROCKFORD, ILL. · SALT LAKE CITY · TOLEDO · TULSA · YOUNGSTOWN

Headquarters Offices: 208 S. La Salle St.—Chicago 4, Ill.

UNITED STATES STEEL

IRON AGE

# STEEL PRICES

Smaller numbers in price boxes indicate producing companies. For main office locations, see key on facing page.
Base prices at producing points apply only to sizes and grades produced in these areas. Prices are in cents per lb unless otherwise noted. Extras apply.

| | Pittsburgh | Chicago | Gary | Cleveland | Canton Massillon | Middletown | Youngstown | Bethlehem | Buffalo | Conshohocken | Johnstown | Sparrows Point | Granite City | Detroit |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **INGOTS** Carbon forging, net ton | $52.00[1] | | | | | | | | | | | | | |
| Alloy, net ton | $54.00[1,17] | | | | | | | | | | | | | $54.00[4] |
| **BILLETS, BLOOMS, SLABS** Carbon, rerolling, net ton | $56.00[1,5] | $56.00[1] | $56.00[1] | | | | | | $56.00[3] | | $56.00[3] | | | |
| Carbon forging billets, net ton | $66.00[1,5] | $66.00[1,4] | $66.00[1] | $66.00[4] | $66.00[4] | | | | $66.00[3,4] | $73.00[26] | $66.00[3] | | | $66.00[4] |
| Alloy, net ton | $70.00[1,17,5] | $70.00[1,4] | $70.00[1,5] | | $70.00[4] | | | $70.00[3] | $70.00[3,4] | $77.00[26] | $70.00[3] | | | $73.00[4] |
| **PIPE SKELP** | 3.35[1]<br>3.45[5] | | | | | | 3.35[1,4] | | | | | | | |
| **WIRE RODS** | 4.10[2]<br>4.30[18] | 4.10[2,4,33] | 4.10[5] | 4.10[2] | | | 4.10[6] | | 4.10[5,5] | | 4.10[3] | 4.20[3] | | |
| **SHEETS** Hot-rolled (18 ga. & hvr.) | 3.60[1,5,9,15]<br>3.75[28] | 3.60[5,23] | 3.60[1,5,8] | 3.60[4,5] | | 3.60[7] | 3.60[1,4,6]<br>4.00[13] | | 3.60[3] | 4.00[26] | | 3.60[3] | 4.30[33] | 3.80[3]<br>4.00[47] |
| Cold-rolled | 4.35[1,5,9,15,7] | | 4.35[1,5,8] | 4.35[4,5] | | 4.35[7] | 4.35[4,6] | | 4.35[3] | | | 4.35[3] | 5.05[33] | 4.55[3] |
| Galvanized (10 gage) | 4.80[1,9,15] | | 4.80[1,8] | | 4.80[4] | 4.80[7] | 5.50[44]<br>6.00[54] | | | | | 4.80[3] | 5.50[32] | |
| Enameling (12 gage) | 4.65[1] | | 4.65[1,5] | 4.65[4] | | 4.65[7] | 4.65[6] | | | | | | 5.35[33] | |
| Long terne (10 gage) | 5.20[9,15] | | 5.20[1] | | | 5.20[7] | 6.00[54] | | | | | | | |
| Hi str. low alloy, h.r. | 5.40[1,5]<br>5.75[9] | 5.40[1] | 5.40[1,8]<br>5.90[5] | 5.40[4,5] | | | 5.40[1,4,13]<br>5.90[6] | | 5.40[3] | 5.65[26] | | 5.40[3] | | 5.90[3] |
| Hi str. low alloy, c.r. | 6.55[1,5]<br>6.90[9] | | 6.55[1,8]<br>7.05[5] | 6.55[4,5] | | | 6.55[4]<br>7.05[6] | | 6.55[3] | | | 6.55[3] | | 7.10[3] |
| Hi str. low alloy, galv. | 7.20[1] | | | | | | | | | | | 6.75[3] | | |
| **STRIP** Hot-rolled | 3.60[9], 4.00[41,58], 3.75[28]<br>3.50[5,7] | 3.50[56] | 3.50[1,5,8] | | | 3.50[7] | 3.50[1,4,6]<br>4.00[13] | | 3.50[3,4] | 3.90[26] | 3.50[3] | 3.50[3] | | 4.00[47]<br>3.80[3] |
| Cold-rolled | 4.65[5,7,9]<br>5.00[28]<br>5.35[40,63,58] | 4.90[5,56] | 4.90[5] | 4.65[2,5] | | 4.65[7] | 4.65[4,5]<br>5.25[45,49]<br>5.35[13,49] | | 4.65[3] | | | 4.65[3] | | 4.85[3]<br>5.45[47]<br>5.80[44,41] |
| Hi str. low alloy, h.r. | 5.75[9] | | 5.50[1]<br>5.30[8], 5.80[5] | | | | 4.95[4], 5.50[1]<br>5.40[13], 5.80[6] | | 4.95[3] | 5.55[26] | | 4.95[3] | | 6.00[3] |
| Hi str. low alloy, c.r. | 7.20[9] | | | 6.55[2]<br>6.70[5] | | | 6.20[4], 6.55[13]<br>7.05[6] | | 6.40[3] | | | 6.40[3] | | |
| **TINPLATE†** Coke, 1.25-lb base box (1.50 lb, add 25¢) | $8.45[1,5,9,15] | | $8.45[1,5,8] | | | | $8.45[4] | | | | | $8.55[3] | | |
| Electrolytic 0.25, 0.50, 0.75 lb box | 0.25 lb base box, $7.15[1,4,5,8,9]; $7.25[3,11]; $7.35[23]<br>0.50 lb, add 25¢; 0.75 lb add 65¢ | | | | | | | | | | | | | |
| **BLACKPLATE, 29 gage** Hollowware enameling | 5.85[1]<br>6.15[18] | | 5.85[1] | | | | 5.30[4] | | | | | | | |
| **BARS** Carbon steel | 3.70[1,5]<br>3.85[9] | 3.70[1,4,33] | 3.70[1,4,5,8] | 3.70[4] | 3.70[4] | | 3.70[1,4,6] | | 3.70[3,4] | | 3.70[3] | | | 3.95[21] |
| Reinforcing | 3.70[1,5] | 3.70[4] | 3.70[1,5,8] | 3.70[4] | | | 3.70[1,4,6] | | 3.70[3,4] | | 3.70[3] | 3.70[3] | | |
| Cold-finished | 4.55[2,4,5,52,69,71] | 4.55[2,33,70] | 4.55[1,74,73] | 4.55[2] | 4.55[4,52] | | 4.55[6,57] | | 4.60[70] | | | | | 4.70[4] |
| Alloy, hot-rolled | 4.30[1,17] | 4.30[1,4,33] | 4.30[1,5,8] | | 4.30[4] | | 4.30[1,6] | 4.30[3] | 4.30[3,4] | | 4.30[3] | | | 4.45[21]<br>4.65[13] |
| Alloy, cold-drawn | 5.40[17,52,69,71,2] | 5.40[4,33,69,70,73]<br>5.45[3] | 5.40[4,73,74] | | 5.40[4,33] | | 5.40[6,25,57] | 5.40[3] | 5.40[3] | | | | | 5.55[24] |
| Hi str. low alloy, h.r. | 5.55[1,5] | | 5.55[1,8]<br>6.05[5] | 5.55[4,5] | | | 5.55[1]<br>6.05[6] | 5.55[3] | 5.55[3] | | 5.55[3] | | | |
| **PLATE** Carbon steel | 3.70[1,5,15]<br>4.00[9] | 3.70[1,33] | 3.70[1,5,8] | 3.70[4,5] | | | 3.70[1,4,6]<br>3.95[13] | | 3.70[3] | 4.15[26] | 3.70[3] | 3.70[3] | 4.40[22] | |
| Floor plates | 4.75[1] | 4.75[1] | 4.75[8] | 4.75[5] | | | | | | 4.75[26] | | | | |
| Alloy | 4.75[1] | 4.75[1] | 4.75[1] | | | | 5.20[13] | | | 5.05[26] | 4.75[3] | 4.75[3] | | |
| Hi str. low alloy | 5.65[1,5] | 5.65[1] | 5.65[1,8]<br>6.15[5] | 5.65[4,5] | | | 5.65[4]<br>5.70[13]<br>6.15[6] | | | 5.90[26] | 5.65[3] | 5.65[3] | | |
| **SHAPES, Structural** | 3.65[1,5]<br>3.90[9] | 3.65[1,33] | 3.65[1,8] | | | | | 3.70[3] | 3.70[3] | | 3.70[3] | | | |
| Hi str. low alloy | 5.50[1,5] | 5.50[1] | 5.50[1,8]<br>6.00[5] | | | | 6.00[5] | 5.50[3] | 5.50[3] | | 5.50[3] | | | |
| **MANUFACTURERS' WIRE** Bright | 4.85[2,5]<br>5.10[18] | 4.85[2]<br>4.33,34 | | 4.85[2] | | | 4.85[5] | Kokomo=4.95[30]<br>4.85[38] | | | 4.85[3] | 4.95[3] | Duluth=4.85[3] | |
| **PILING, Steel Sheet** | 4.45[1] | 4.45[1] | 4.45[8] | | | | | | 4.45[3] | | | | | |

# STEEL PRICES

Smaller numbers indicate producing companies. See key at right. Prices are in cents per lb unless otherwise noted. Extras apply.

| Kansas City | Houston | Birmingham | WEST COAST Seattle, San Francisco, Los Angeles, Fontana | | |
|---|---|---|---|---|---|
| | | | F=$79.00[19] | | INGOTS Carbon forging, net ton |
| | $62.00[83] | | F=$80.00[19] | | Alloy, net ton |
| | | $56.00[11] | F=$75.00[19] | | BILLETS, BLOOMS, SLABS Carbon, rerolling, net ton |
| | $74.00[83] | $66.00[11] | F=$85.00[19]<br>SF, LS, S=$85.00[62] | Geneva=$66.00[16] | Carbon forging billets, net ton |
| | $78.00[83] | | F=$89.00[19]<br>LA=$90.00[62] | | Alloy net ton |
| | | | | | PIPE SKELP |
| | 4.50[83] | 4.10[4,11] | SF=4.90[2], F=4.90[19]<br>LA=4.90[24,62] | Worcester=4.40[3]<br>Minnequa=4.35[14]<br>Portsmouth=4.30[20] | WIRE RODS |
| | | 3.60[4,11] | SF, LA=4.30[24]<br>F=4.55[19] | Niles=5.25[84], Geneva=3.70[16]<br>Ashland=3.60[7] | SHEETS Hot-rolled (18 ga. & hvr.) |
| | | 4.35[11] | SF=5.30[24]<br>F=5.30[19] | | Cold-rolled |
| | | 4.80[4,11] | SF, LA=5.55[24] | Ashland=4.80[7]<br>Kokomo=5.20[30] | Galvanized (10 gage) |
| | | | | Ashland=4.65[7] | Enameling (12 gage) |
| | | | | | Long ternes (10 gage) |
| | | 5.40[11] | F=6.35[19] | | Hi str. low alloy, h.r. |
| | | | F=7.50[19] | | Hi str. low alloy, c.r. |
| | | | | | Hi str. low alloy, galv. |
| 4.10[83] | 4.90[83] | 3.50[4,11] | SF, LA=4.25[24,62]<br>F=4.75[19], S=4.50[62] | Atlanta=4.05[65]<br>Minnequa=4.55[14]<br>Ashland=3.50[7] | STRIP Hot-rolled |
| | | | F=6.30[19]<br>LA=6.40[27] | New Haven=5.15[3], 5.85[58]<br>Trenton=6.00[45] | Cold-rolled |
| | | 5.30[11] | F=6.20[19]<br>SF, LA=6.05[83]<br>S=6.30[62] | | Hi str. low alloy, h.r. |
| | | | F=6.95[19] | | Hi str. low alloy, c.r. |
| | | $8.55[11] | SF=9.20[24] | | TINPLATE Cokes, 1.25-lb base box (1.50 lb, add 25¢) |
| | | | | | Electrolytic 0.25, 0.50, 0.75 lb box |
| | | | | | BLACKPLATE, 29 gage Hollowware enameling |
| 4.30[83] | 4.10[83] | 3.70[4,11] | SF, LA=4.40[24] | Atlanta=4.25[65]<br>Minnequa=4.15[14] | BARS Carbon steel |
| 4.30[83] | 4.10[83] | 3.70[4,11] | SF, S=4.45[62]<br>F=4.40[19], LA=4.40[83] | Atlanta=4.25[65]<br>Minnequa=4.50[14] | Reinforcing |
| | | | LA=6.00[4] | Newark=5.00[89]<br>Putnam=5.10[89]<br>Hartford=5.10[4] | Cold-finished |
| 4.90[83] | 4.70[83] | | LA=5.35[62]<br>F=5.35[19] | | Alloy, hot-rolled |
| | | | | Newark=5.75[89]<br>Worcester=5.75[3]<br>Hartford=5.85[4] | Alloy, cold-drawn |
| | | 5.55[11] | F=6.60[19] SF, S=6.30[62]<br>LA=6.25[62] | | Hi str. low alloy, h.r. |
| | 4.10[83] | 3.70[4,11] | F=4.30[19]<br>S=4.60[62] | Claymont=4.15[29]<br>Coatesville=4.15[21]<br>Minnequa=4.50[14]<br>Geneva=3.70[16] | PLATE Carbon steel |
| | | | | Harrisburg=5.25[35] | Floor plates |
| | | | F=5.70[19] | Coatesville=5.25[21]<br>Claymont=4.85[29] | Alloy |
| | | 5.65[11] | F=6.25[19]<br>S=6.55[62] | Geneva=5.65[16] | Hi str. low alloy |
| 4.25[83] | 4.05[83] | 3.60[4]<br>3.65[11] | SF=4.20[62] F=4.25[19]<br>LA=4.25[24,62] S=4.30[62] | Geneva 3.65[16] Minnequa 4.10[14] | SHAPES, Structural |
| | | 5.50[11] | SF=6.10[62,19]<br>SF=6.00[62] LA=6.05[62] | Geneva=5.50[16] | Si str. low alloy |
| 5.45[83] | 5.25[83] | 4.85[4,11] | SF, LA=5.80[24] | Atlanta=5.10[65] Worcester=5.15[3] Minnequa=5.10[14] Portsmouth=5.25[20] | MANUFACTURERS' WIRE Bright |

†Special coated mfg ternes deduct 95¢ from 1.25-lb coke base box price. Can-making quality blackplate, 55 to 128-lb, deduct $2.20 from 1.25-lb coke base box.

## Key to Steel Producers

1 U. S. Steel Co., Pittsburgh
2 American Steel & Wire Co., Cleveland
3 Bethlehem Steel Co., Bethlehem
4 Republic Steel Corp., Cleveland
5 Jones & Laughlin Steel Corp., Pittsburgh
6 Youngstown Sheet & Tube Co., Youngstown
7 Armco Steel Corp., Middletown, Ohio
8 Inland Steel Co., Chicago
9 Weirton Steel Co., Weirton, W. Va.
10 National Tube Co., Pittsburgh
11 Tennessee Coal, Iron & R. R. Co., Birmingham
12 Great Lakes Steel Corp., Detroit
13 Sharon Steel Corp., Sharon, Pa.
14 Colorado Fuel & Iron Corp., Denver
15 Wheeling Steel Corp., Wheeling, W. Va.
16 Geneva Steel Co., Salt Lake City
17 Crucible Steel Co. of America, New York
18 Pittsburgh Steel Co., Pittsburgh
19 Kaiser Steel Corp., Oakland, Calif.
20 Portsmouth Div., Detroit Steel Corp., Detroit
21 Lukens Steel Co., Coatesville, Pa.
22 Granite City Steel Co., Granite City, Ill.
23 Wisconsin Steel Co., South Chicago, Ill.
24 Columbia Steel Co., San Francisco
25 Copperweld Steel Co., Glassport, Pa.
26 Alan Wood Steel Co., Conshohocken, Pa.
27 Calstrip Steel Corp., Los Angeles
28 Allegheny Ludlum Steel Corp., Pittsburgh
29 Claymont Steel Corp., Claymont, Del.
30 Continental Steel Corp., Kokomo, Ind.
31 Rotary Electric Steel Co., Detroit
32 Laclede Steel Co., St. Louis
33 Northwestern Steel & Wire Co., Sterling, Ill.
34 Keystone Steel & Wire Co., Peoria, Ill.
35 Central Iron & Steel Co., Harrisburg, Pa.
36 Carpenter Steel Co., Reading, Pa.
37 Eastern Stainless Steel Corp., Baltimore
38 Washington Steel Corp., Washington, Pa.
39 Jessop Steel Co., Washington, Pa.
40 Blair Strip Steel Co., New Castle, Pa.
41 Superior Steel Corp., Carnegie, Pa.
42 Timken Steel & Tube Div., Canton, Ohio
43 Babcock & Wilcox Tube Co., Beaver Falls, Pa.
44 Reeves Steel & Mfg. Co., Dover, Ohio
45 John A. Roebling's Sons Co., Trenton, N. J.
46 Simonds Saw & Steel Co., Fitchburg, Mass.
47 McLouth Steel Corp., Detroit
48 Cold Metal Products Co., Youngstown
49 Thomas Steel Co., Warren, Ohio
50 Wilson Steel & Wire Co., Chicago
51 Sweet's Steel Co., Williamsport, Pa.
52 Superior Drawn Steel Co., Monaca, Pa.
53 Tremont Nail Co., Wareham, Mass.
54 Firth Sterling St. & Carbide Corp., McKeesport
55 Ingersoll Steel Div., Chicago
56 Phoenix Iron & Steel Co., Phoenixville, Pa.
57 Fitzsimons Steel Co., Youngstown
58 Stanley Works, New Britain, Conn.
59 Universal-Cyclops Steel Corp., Bridgeville, Pa.
60 American Cladmetals Co., Carnegie, Pa.
61 Cuyahoga Steel & Wire Co., Cleveland
62 Bethlehem Pacific Coast Steel Corp., San Fran.
63 Follansbee Steel Corp., Pittsburgh
64 Niles Rolling Mill Co., Niles, Ohio
65 Atlantic Steel Co., Atlanta
66 Acme Steel Co., Chicago
67 Joslyn Mfg. & Supply Co., Chicago
68 Detroit Steel Corp., Detroit
69 Wycoff Steel Co., Pittsburgh
70 Bliss & Laughlin, Inc., Harvey, Ill.
71 Columbia Steel & Shafting Co., Pittsburgh
72 Cumberland Steel Co., Cumberland, Md.
73 La Salle Steel Co., Chicago
74 Monarch Steel Co., Inc., Hammond, Ind.
75 Empire Steel Co., Mansfield, Ohio
76 Mahoning Valley Steel Co., Niles, Ohio
77 Oliver Iron & Steel Co., Pittsburgh
78 Pittsburgh Screw & Bolt Co., Pittsburgh
79 Standard Forging Corp., Chicago
80 Driver Harris Co., Harrison, N. J.
81 Detroit Tube & Steel Div., Detroit
82 Reliance Div., Eaton Mfg. Co., Massillon, Ohio
83 Sheffield Steel Corp., Kansas City
84 Plymouth Steel Co., Detroit
85 Wickwire Spencer Steel, Buffalo
86 Angell Nail and Chaplet, Cleveland
87 Mid-States Steel & Wire, Crawfordsville, Ind.
88 National Supply, Pittsburgh, Pa.
89 Wheatland Tube Co., Wheatland, Pa.
90 Mercer Tube & Mfg. Co., Sharon, Pa.
91 Woodward Iron Co., Woodward, Ala.
92 Sloss-Sheffield Steel & Iron Co., Birmingham
93 Hanna Furnace Corp., Detroit
94 Interlake Iron Corp., Cleveland
95 Lone Star Steel Co., Dallas
96 Mystic Iron Works, Everett, Mass.
97 Jackson Iron & Steel Co., Jackson, O.
98 Globe Iron Co., Jackson, O.
99 Pittsburgh Coke & Chemical Co., Pittsburgh
100 Shenango Furnace Co., Pittsburgh
101 Tennessee Products & Chem. Corp., Nashville
102 Koppers Co., Inc., Granite City, Ill.
103 Page Steel & Wire Div., American Chain & Cable, Monessen, Pa.
104 Wallingford Steel Co., Wallingford, Conn.
105 Tonawanda Iron Div., N. Tonawanda, N. Y.

## STAINLESS STEELS

Base price cents per lb, f.o.b. mill.

| Product | 301 | 302 | 303 | 304 | 316 | 321 | 347 | 410 | 416 | 430 |
|---|---|---|---|---|---|---|---|---|---|---|
| Ingots rerolling | 14.25 | 15.25 | 16.75 | 16.25 | 24.75 | 20.00 | 21.75 | 12.75 | 14.75 | 13.00 |
| Slabs billets rerolling | 18.50 | 20.00 | 22.00 | 21.00 | 32.25 | 26.25 | 28.50 | 16.50 | 20.00 | 16.75 |
| Forg. discs die blocks rings | 34.00 | 34.25 | 36.75 | 35.75 | 53.00 | 40.25 | 44.75 | 28.00 | 28.50 | 28.50 |
| Billets forging | 26.25 | 26.50 | 28.50 | 27.75 | 41.50 | 31.25 | 35.00 | 21.50 | 22.00 | 22.00 |
| Bars wires structurals | 31.25 | 31.50 | 34.00 | 33.00 | 49.25 | 37.00 | 41.50 | 25.75 | 26.25 | 26.25 |
| Plates | 33.00 | 33.25 | 35.25 | 35.25 | 52.00 | 40.75 | 45.25 | 27.00 | 27.50 | 27.50 |
| Sheets | 41.00 | 41.25 | 43.25 | 43.25 | 57.00 | 49.25 | 53.75 | 36.50 | 37.00 | 39.00 |
| Strip hot-rolled | 26.50 | 28.25 | 32.50 | 30.25 | 48.75 | 37.00 | 41.25 | 23.50 | 30.25 | 24.00 |
| Strip cold-rolled | 34.00 | 36.75 | 40.25 | 38.75 | 59.00 | 48.25 | 52.25 | 30.50 | 37.00 | 31.00 |

STAINLESS STEEL PRODUCING POINTS—*Sheets:* Midland, Pa., 17; Brackenridge, Pa., 28; Butler, Pa., 7; McKeesport, Pa., 1; Washington, Pa., 38 (type 316 add 4, 5¢), 39; Baltimore, 37; Middletown, Ohio, 7; Massillon, Ohio, 4; Gary, 1; Bridgeville, Pa., 59; New Castle, Ind., 55; Ft. Wayne, Ind., 67; Lockport, N. Y., 45.

*Strip:* Midland, Pa., 17; Cleveland, 2; Carnegie, Pa., 41; McKeesport, Pa., 54; Reading, Pa., 36; Washington, Pa., 38 (type 316 add 4, 5¢); W. Leechburg, Pa., 28; Bridgeville, Pa., 59; Detroit, 47; Massillon, Canton, Ohio, 4; Middletown, Ohio, 7; Harrison, N. J., 80; Youngstown, 48; Lockport, N. Y., 46; New Britain, Conn., 58; Sharon, Pa., 13; Butler, Pa., 7; Wallingford, Conn., 104.

*Bars:* Baltimore, 7; Duquesne, Pa., 1; Munhall, Pa., 1; Reading, Pa., 36; Titusville, Pa., 59; Washington, Pa., 39; McKeesport, Pa., 1, 54; Bridgeville, Pa., 59; Dunkirk, N. Y., 28; Massillon, Ohio, 4; Chicago, 1; Syracuse, N. Y., 17; Watervliet, N. Y., 28; Waukegan, Ill., 2; Lockport, N. Y., 46; Canton, Ohio, 42; Ft. Wayne, Ind., 67.

*Wire:* Waukegan, Ill., 2; Massillon, Ohio, 4; McKeesport, Pa., 54; Bridgeport, Conn., 44; Ft. Wayne, Ind., 67; Trenton, N. J., 45; Harrison, N. J., 80; Baltimore, 7; Dunkirk, 28; Monessen, 103; Syracuse, N. Y., 17; Bridgeville, Pa., 59.

*Structurals:* Baltimore, 7; Massillon, Ohio, 4; Chicago, 1, 67; Watervliet, N. Y., 28; Bridgeport, Conn., 44; Syracuse, N. Y., 17.

*Plates:* Brackenridge, Pa., 28 (type 416 add ½¢); Butler, Pa., 7; Chicago, 1; Munhall, Pa., 1; Midland, Pa., 17; New Castle, Ind., 55; Lockport, N. Y., 46; Middletown, 7; Washington, Pa., 39; Cleveland, Massillon, 4.

*Forged discs, die blocks, rings:* Pittsburgh, 17; Syracuse, 17; Ferndale, Mich., 28; Washington, Pa., 39.

*Forging billets:* Midland, Pa., 17; Baltimore, 7; Washington, Pa., 39; McKeesport, 54; Massillon, Canton, Ohio, 4; Watervliet, 28; Pittsburgh, Chicago, 1; Syracuse, N. Y., 17.

*ALLEGHENY LUDLUM—Slightly higher on Type 301; slightly lower on others in 300 Series.

WASHINGTON STEEL—Slightly lower on 300 Series except where noted.

## MERCHANT WIRE PRODUCTS

| F.o.b. Mill | Standard & Coated Nails Base Col. | Woven Wire Fence 9-15½ ga. Base Col. | Fence Posts Base Col. | Single Loop Bale Ties Base Col. | Twisted Barbless Wire Base Col. | Gal. Barbed Wire Base Col. | Merch. Wire Ann'ld ¢/lb. | Merch. Wire Gal. (1) ¢/lb. |
|---|---|---|---|---|---|---|---|---|
| Alabama City-4 | 118 | 126 | .... | 123 | .... | 136 | 5.70 | 5.95 |
| Aliquippa, Pa.-5 | 118 | 132 | .... | .... | 136 | 140 | 5.70 | 6.15 |
| Atlanta-65 | 121 | 133 | .... | 126 | 126 | 143 | 5.95 | 6.40 |
| Bartonville-34 | 118 | 130 | .... | 123 | 143 | 143 | 5.70 | 6.15 |
| Buffalo-85 | .... | .... | .... | .... | .... | .... | 4.85 | .... |
| Cleveland-86 | 125 | .... | .... | .... | .... | .... | .... | .... |
| Cleveland-2 | .... | .... | .... | .... | .... | 145 | 5.70 | 6.15 |
| Crawfordsville-87 | .... | 132 | .... | .... | .... | 145 | 5.95 | 6.40 |
| Donora, Pa.-2 | 118 | 130 | .... | 123 | 140 | 140 | 5.70 | 6.15 |
| Duluth-2 | 118 | 130 | .... | 123 | 140 | 140 | 5.70 | 6.15 |
| Fairfield, Ala.-11 | 118 | 130 | .... | 123 | .... | 140 | 5.70 | 6.15 |
| Houston-83 | 126 | 138 | .... | .... | .... | 148 | 6.10 | 6.55 |
| Johnstown, Pa.-3 | 118 | 130 | .... | .... | 140 | .... | 5.70 | 6.15 |
| Joliet, Ill.-2 | 118 | 130 | .... | 123 | .... | 140 | 5.70 | 6.15 |
| Kokomo, Ind.-30 | 120 | 132 | .... | 125 | 138 | 142 | 5.80 | 6.05 |
| Los Angeles-62 | .... | .... | .... | .... | .... | .... | 6.65 | .... |
| Kansas City-83 | 130 | .... | .... | 135 | .... | 152 | 6.30 | 6.75 |
| Minnequa-14 | 123 | 138 | 130 | 128 | 146 | 146 | 5.95 | 6.45 |
| Monessen-18 | 124 | 135 | .... | .... | .... | 145 | 5.95 | 6.40 |
| Moline, Ill.-4 | .... | .... | 136 | .... | .... | .... | .... | .... |
| Pittsburg, Cal.-24 | 137 | .... | .... | 147 | 156 | 160 | 6.65 | 6.80 |
| Portsmouth-20 | 124 | 137 | .... | .... | 147 | 147 | 6.10 | 6.60 |
| Rankin, Pa.-2 | 118 | 130 | .... | .... | 140 | 140 | 5.70 | 6.15 |
| So. Chicago, Ill.-4 | 118 | 126 | 140 | 123 | .... | 136 | 5.70 | 5.95 |
| S. San Fran.-14 | .... | .... | .... | 147 | .... | 160 | 6.65 | 7.10 |
| Sparrows Pt.-3 | 120 | .... | .... | 125 | 142 | 142 | 5.80 | 6.25 |
| Sterling, Ill.-33 | 118 | 130 | .... | 123 | 140 | 140 | 5.70 | 6.15 |
| Struthers, Ohio-6 | .... | .... | .... | .... | .... | .... | 5.70 | 6.15 |
| Torrance, Cal.-24 | 138 | .... | .... | .... | .... | .... | 6.65 | .... |
| Worcester-2 | 124 | .... | .... | .... | .... | .... | 6.00 | 6.45 |
| Williamsport, Pa-51 | .... | .... | 150 | .... | .... | .... | .... | .... |

Cut Nails, carloads, base, $7.35 per 100 lb (less 20¢ to jobbers), at Conshohocken, Pa., (28), Wheeling, W. Va., (15), $7.15.

(1) Alabama City and So. Chicago do not include zinc extra.

## CAST IRON WATER PIPE

*Per Net Ton*

6 to 24-in., del'd Chicago. $105.30 to $108.80
6 to 24-in., del'd N. Y. .... 108.50 to 109.50
6 to 24-in., Birmingham. 91.50 to 96.00
6-in and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less ..... 123.00 to 130.00
Class "A" and as pipe, $5 extra; 4-in. pipe is $5 a ton above 6-in.

## RAILS, TRACK SUPPLIES

| F.o.b. Mill Cents Per Lb | No. 1 Std. Rails | Light Rails | Joint Bars | Track Spikes | Axles | Screw Spikes | Tie Plates | Track Bolts Treated |
|---|---|---|---|---|---|---|---|---|
| Bessemer-1 | 3.60 | 4.00 | 4.70 | .... | .... | .... | .... | .... |
| Chicago-4 | .... | .... | .... | 6.15 | .... | .... | .... | .... |
| Ensley-11 | 3.60 | 4.00 | .... | .... | .... | .... | .... | .... |
| Fairfield-11 | .... | 4.00 | 4.40 | .... | .... | 8.80 | 4.50 | .... |
| Gary-1 | 3.60 | 4.00 | .... | .... | .... | .... | 4.50 | .... |
| Ind. Harbor-8 | 3.60 | .... | 4.70 | 6.15 | 5.60 | 8.80 | 4.50 | .... |
| Johnstown-3 | .... | 4.00 | .... | .... | 5.60 | 8.80 | .... | .... |
| Joliet-1 | .... | 4.00 | 4.70 | .... | .... | .... | .... | .... |
| Kansas City-83 | .... | .... | .... | 6.40 | .... | .... | .... | 9.85 |
| Lackawanna-3 | 3.60 | 4.00 | 4.70 | .... | .... | 8.80 | 4.50 | .... |
| Lebanon-3 | .... | .... | .... | 6.15 | .... | .... | .... | 9.85 |
| Minnequa-14 | 3.60 | 4.50 | 4.70 | 6.15 | .... | 8.80 | 4.50 | 9.85 |
| Pittsburgh-77 | .... | .... | .... | .... | .... | 9.35 | .... | 9.85 |
| Pittsburgh-78 | .... | .... | .... | .... | .... | .... | .... | 9.85 |
| Pittsburgh-5 | .... | .... | .... | 6.15 | .... | .... | .... | .... |
| Pittsburgh-24 | .... | .... | .... | .... | .... | .... | 4.65 | .... |
| Seattle-62 | .... | .... | .... | 6.65 | .... | .... | 4.65 | .... |
| Steelton-3 | 3.60 | .... | 4.70 | .... | .... | .... | 4.50 | .... |
| Struthers-6 | .... | .... | .... | 6.15 | .... | .... | .... | .... |
| Torrance-24 | .... | .... | .... | .... | .... | .... | 4.65 | .... |
| Youngstown-4 | .... | .... | .... | 6.15 | .... | .... | .... | .... |

## BOILER TUBES

$ Per 100 ft., cut, 10 to 24 ft.

| F.o.b. Mill | Size OD-In. | Size B.W. Ga. | Seamless H.R. | Seamless C.D. | Elec. Weld H.R. | Elec. Weld C.D. |
|---|---|---|---|---|---|---|
| Babcock & Wilcox | 2 | 13 | 22.67 | 26.66 | 21.99 | 25.84 |
| | 2½ | 12 | 30.48 | 35.84 | 29.57 | 34.76 |
| | 3 | 12 | 33.90 | 39.90 | 32.89 | 38.70 |
| | 3½ | 11 | 42.37 | 49.89 | 41.10 | 48.39 |
| | 4 | 10 | 52.60 | 61.88 | 51.03 | 60.02 |
| National Tube | 2 | 13 | 21.62 | 26.48 | .... | .... |
| | 2½ | 12 | 29.65 | 36.32 | .... | .... |
| | 3 | 12 | 34.00 | 41.64 | .... | .... |
| | 3½ | 11 | 40.34 | 49.41 | .... | .... |
| | 4 | 10 | 51.21 | 62.72 | .... | .... |
| Pittsburgh Steel | 2 | 13 | .... | 27.08 | .... | .... |
| | 2½ | 12 | 30.49 | 37.15 | .... | .... |
| | 3 | 12 | 34.95 | 42.59 | .... | .... |
| | 3½ | 11 | 41.48 | 50.54 | .... | .... |
| | 4 | 10 | 52.65 | 64.16 | .... | .... |

## FLUORSPAR

Washed gravel, f.o.b. Rosiclaire, Ill. Price, net ton; Effective $CaF_2$ content:
70% or more ..... $43.00
60% or less ..... 40.00

## PIPE AND TUBING

Base discounts, f.o.b. mills. Base price about $200 per net ton.

| | BUTTWELD ½ In. Blk. | ½ In. Gal. | ¾ In. Blk. | ¾ In. Gal. | 1 In. Blk. | 1 In. Gal. | 1¼ In. Blk. | 1¼ In. Gal. | 1½ In. Blk. | 1½ In. Gal. | 2 In. Blk. | 2 In. Gal. | 2½-3 In. Blk. | 2½-3 In. Gal. | SEAMLESS 2 In. Blk. | 2 In. Gal. | 2½-3 In. Blk. | 2½-3 In. Gal. | 3½-4In. Blk. | 3½-4In. Gal. |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STANDARD T. & C. | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt.-3 | 34.0 | 12.0 | 37.0 | 16.0 | 39.5 | 19.5 | 40.0 | 20.0 | 40.5 | 21.0 | 41.0 | 21.5 | 41.5 | 22.0 | .... | .... | .... | .... | .... | .... |
| Cleveland-4 | 36.0 | 14.0 | 39.0 | 18.0 | 41.5 | 21.5 | 42.9 | 22.0 | 42.5 | 23.0 | 43.0 | 23.5 | 43.5 | 24.0 | .... | .... | .... | .... | .... | .... |
| Oakland-19 | 25.0 | 3.0 | 28.0 | 7.0 | 30.5 | 10.5 | 31.0 | 11.0 | 31.5 | 12.0 | 32.0 | 12.5 | 32.5 | 13.0 | .... | .... | .... | .... | .... | .... |
| Pittsburgh-5 | 36.0 | 14.0 | 39.0 | 17.0 | 41.5 | 19.5 | 42.0 | 20.5 | 42.5 | 21.0 | 43.0 | 21.5 | 43.5 | 22.5 | 29.5 | 9.0 | 32.5 | 11.5 | 34.5 | 13.5 |
| Pittsburgh-10 | 36.0 | 14.0 | 39.0 | 18.0 | 41.5 | 21.5 | 42.0 | 22.0 | 42.5 | 23.0 | 43.0 | 23.5 | 43.5 | 24.0 | 29.5 | 9.5 | 32.5 | 12.5 | 34.5 | 14.5 |
| St. Louis-32 | 35.0 | 13.0 | 38.0 | 17.0 | 40.5 | 20.5 | 41.0 | 21.0 | 41.5 | 22.0 | 42.0 | 22.5 | 42.5 | 23.0 | .... | .... | .... | .... | .... | .... |
| Sharon-90 | 36.0 | 13.0 | 39.0 | 17.0 | 41.5 | 20.0 | 42.0 | 20.5 | 42.5 | 21.0 | 43.0 | 21.5 | 43.5 | 22.0 | .... | .... | .... | .... | .... | .... |
| Pittsburgh-88 | 36.0 | 14.0 | 39.0 | 18.0 | 41.5 | 21.5 | 42.0 | 22.0 | 42.5 | 23.0 | 43.0 | 23.5 | 43.5 | 24.0 | 29.5 | .... | 32.5 | .... | 34.5 | .... |
| Wheeling-15 | 36.0 | 14.0 | 39.0 | 18.0 | 41.5 | 21.5 | 42.0 | 22.0 | 42.5 | 23.0 | 43.0 | 23.5 | 43.5 | 24.0 | .... | .... | .... | .... | .... | .... |
| Wheatland-89 | 36.0 | 14.0 | 39.0 | 17.0 | 41.5 | 19.5 | 42.0 | 20.5 | 42.5 | 21.0 | 43.0 | 21.5 | 43.5 | 22.5 | .... | .... | .... | .... | .... | .... |
| Youngstown-6 | 36.0 | 14.0 | 39.0 | 18.0 | 41.5 | 21.5 | 42.0 | 22.0 | 42.5 | 23.0 | 43.0 | 23.5 | 43.5 | 24.0 | 29.5 | 9.5 | 32.5 | 12.5 | 34.5 | 14.5 |
| EXTRA STRONG, PLAIN ENDS | | | | | | | | | | | | | | | | | | | | |
| Sparrows Pt.-3 | 33.5 | 13.0 | 37.5 | 17.0 | 39.5 | 20.5 | 40.0 | 21.0 | 40.5 | 22.0 | 41.0 | 22.5 | 41.5 | 23.0 | .... | .... | .... | .... | .... | .... |
| Cleveland-4 | 35.5 | 15.0 | 39.5 | 19.0 | 41.5 | 22.5 | 42.0 | 23.0 | 42.5 | 24.0 | 43.0 | 24.5 | 43.5 | 25.0 | .... | .... | .... | .... | .... | .... |
| Oakland-19 | 24.5 | 4.0 | 28.5 | 8.0 | 30.5 | 11.5 | 31.0 | 12.0 | 31.5 | 13.0 | 32.0 | 13.5 | 32.5 | 14.0 | .... | .... | .... | .... | .... | .... |
| Pittsburgh-5 | 35.5 | 13.5 | 39.5 | 17.5 | 41.5 | 19.5 | 42.0 | 20.5 | 42.5 | 21.0 | 43.0 | 21.5 | 43.5 | 22.5 | 29.0 | 7.5 | 33.0 | 12.0 | 36.5 | 15.5 |
| Pittsburgh-10 | 35.5 | 15.0 | 39.5 | 19.0 | 41.5 | 22.5 | 42.0 | 23.0 | 42.5 | 24.0 | 43.0 | 24.5 | 43.5 | 25.0 | 29.0 | 10.0 | 33.0 | 14.0 | 36.5 | 17.5 |
| St. Louis-32 | 34.5 | 14.0 | 38.5 | 18.0 | 40.5 | 21.5 | 41.0 | 22.0 | 41.5 | 23.0 | 42.0 | 23.5 | 42.5 | 24.0 | .... | .... | .... | .... | .... | .... |
| Sharon-90 | 35.5 | 14.0 | 39.5 | 18.0 | 41.5 | 21.0 | 42.0 | 21.5 | 42.5 | 22.0 | 43.0 | 22.5 | 43.5 | 23.0 | .... | .... | .... | .... | .... | .... |
| Pittsburgh-88 | 35.5 | 15.0 | 39.5 | 19.0 | 41.5 | 22.5 | 42.0 | 23.0 | 42.5 | 24.0 | 43.0 | 24.5 | 43.5 | 25.0 | 29.0 | .... | 33.0 | .... | 36.5 | .... |
| Wheeling-15 | 35.5 | 15.0 | 39.5 | 19.0 | 41.5 | 22.5 | 42.0 | 23.0 | 42.5 | 24.0 | 43.0 | 24.5 | 43.5 | 25.0 | .... | .... | .... | .... | .... | .... |
| Wheatland-89 | 35.5 | 13.5 | 39.5 | 17.5 | 41.5 | 19.5 | 42.0 | 20.5 | 42.5 | 21.0 | 43.0 | 21.5 | 43.5 | 22.5 | .... | .... | .... | .... | .... | .... |
| Youngstown-6 | 35.5 | 15.0 | 39.5 | 19.0 | 41.5 | 22.5 | 42.0 | 23.0 | 42.5 | 24.0 | 43.0 | 24.5 | 43.5 | 26.0 | 29.0 | 10.0 | 33.0 | 14.0 | 36.5 | 17.5 |

Galvanized discounts based on zinc at 17¢ per lb, East St. Louis. For each 1¢ change in zinc, discounts vary as follows: ½ in., ¾ in., and 1 in., 1 pt.; 1¼ in., 1½ in., 2 in., ¾ pt.; 2½ in., 3 in., ½ pt. Calculate discounts on even cents per lb of zinc, i.e., if zinc is 16.51¢ to 17.50¢ per lb, use 17¢. Jones & Laughlin discounts apply only when zinc price changes 1¢.

Threads only, buttweld and seamless, 1 pt. higher discount. Plain ends, buttweld and seamless, 3 in. and under, 3½ pts. higher discount. Buttweld jobbers' discount, 5 pct.

## WAREHOUSES

Base price, f.o.b., dollars per 100 lb. *(Metropolitan area delivery add 20¢ except Birmingham, San Francisco, Cincinnati, New Orleans, St. Paul, add 15¢; Memphis, add 10¢; Philadelphia, add 25¢; New York, add 30¢).

| Cities | Sheets | | | Strip | | Plates | Shapes | Bars | | Alloy Bars | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Hot-Rolled | Cold-Rolled (15 gage) | Galvanized (10 gage) | Hot-Rolled | Cold-Rolled | | Standard Structural | Hot-Rolled | Cold-Finished | Hot-Rolled A 4615 As rolled | Hot-Rolled A 4140 Annealed | Cold-Drawn A 4615 As rolled | Cold-Drawn A 4140 Annealed |
| Baltimore | 5.60 | 6.84 | 7.49[2]–8.07 | 6.04 | ..... | 5.80 | 6.14 | 6.04 | 6.84–6.89 | 10.24 | 10.84 | 11.89 | 12.19 |
| Birmingham* | 5.60 | 6.40 | 6.75 | 5.55 | ..... | 5.95 | 5.70 | 5.55 | ..... | ..... | ..... | ..... | ..... |
| Boston | 6.20 | 7.00–7.25 | 7.74–8.29 | 6.15 | 8.50[4] | 6.48–6.78 | 6.20 | 6.05 | 6.79–6.84 | 10.25 | 10.55 | 11.90–12.00 | 12.20–12.30 |
| Buffalo | 5.60 | 6.40 | 7.74–8.09 | 5.86 | ..... | 6.05 | 5.80 | 5.60 | 6.40–6.45 | 10.15–10.85 | 10.45 | 11.80 | 11.95–12.10 |
| Chicago | 5.60 | 6.40 | 7.75 | 5.55 | ..... | 5.80 | 5.70 | 5.55 | 6.30 | 9.80 | 10.10 | 11.45 | 11.75 |
| Cincinnati* | 5.87 | 6.44 | 7.39 | 5.80 | ..... | 6.19 | 6.09 | 5.80 | 6.61 | 10.15 | 10.45 | 11.80 | 12.10 |
| Cleveland | 5.60 | 6.40 | 8.10 | 5.69 | 6.90 | 5.92 | 5.82 | 5.57 | 6.40 | 9.91 | 10.21 | 11.56 | 11.86 |
| Detroit | 5.78 | 6.53 | 7.89 | 5.94 | ..... | 5.99 | 6.09 | 5.84 | 6.56 | 10.11 | 10.41 | 11.76 | 12.06 |
| Houston | 7.00 | 8.25 | ..... | ..... | ..... | 6.85 | 6.50 | 6.65 | 9.35 | 10.35 | 11.25 | ..... | 12.75 |
| Indianapolis, del'd | 6.00 | 6.80 | 8.15 | 5.95 | ..... | 6.20 | 6.10 | 5.95 | 6.80 | ..... | ..... | ..... | ..... |
| Kansas City | 6.00 | 6.80 | 7.45 | 6.15 | 7.50 | 6.40 | 6.30 | 6.15 | 7.00 | 10.40 | 10.70 | 12.05 | 12.35 |
| Los Angeles | 6.35 | 7.90 | 8.85 | 6.40 | 9.45[4] | 6.40 | 6.35 | 6.35 | 8.20 | 11.30 | 11.30 | 13.20 | 13.50 |
| Memphis* | 6.33–6.38 | 7.06–7.18 | ..... | 6.33–6.38 | ..... | 6.43–8.02 | 6.33–6.48 | 6.08–6.33 | 7.16–7.32 | ..... | ..... | ..... | ..... |
| Milwaukee | 5.74 | 6.54 | 7.89 | 5.69–6.59 | ..... | 5.94 | 5.84 | 5.69 | 6.44–6.54 | 9.94 | 10.24 | 11.59 | 11.89 |
| New Orleans* | 5.70 | 6.59 | ..... | 5.75 | 7.25 | 5.95 | 5.75 | 5.75 | 7.30 | ..... | ..... | ..... | ..... |
| New York* | 5.67–5.97 | 7.19[5]–7.24[1] | 8.14[2] | 6.29–6.89 | 8.63[4] | 6.28–6.58 | 6.10 | 6.12 | 6.99 | 10.05–10.15 | 10.35–10.45 | 11.70–11.80 | 12.10–12.20 |
| Norfolk | 6.50[3] | ..... | ..... | ..... | ..... | 6.50[3] | 6.60[3] | 6.55[3] | ..... | ..... | ..... | ..... | ..... |
| Philadelphia* | 5.90 | 6.80 | 8.00 | 6.10 | ..... | 6.05 | 5.90 | 6.05 | 6.86 | 9.90 | 10.20 | ..... | ..... |
| Pittsburgh | 5.60 | 6.40 | 7.75 | 5.65–5.95 | ..... | 5.75 | 5.70 | 5.55 | 6.15 | 9.80 | 10.10 | 11.45 | 11.75 |
| Portland | 6.60–7.55 | 8.95 | 8.50–9.10 | 7.30 | ..... | 6.80 | 6.95 | 6.90 | ..... | ..... | 12.15 | ..... | ..... |
| Salt Lake City | 7.95 | ..... | 9.70–10.50[2] | 8.70–8.75 | ..... | 8.05 | 6.75–8.30 | 7.95–8.65 | 9.00 | ..... | ..... | ..... | ..... |
| San Francisco* | 6.65 | 8.05[2] | 8.55–8.90[2] | 6.60 | 9.95[6] | 6.50 | 6.45 | 6.45 | 8.20 | 11.30 | 11.30 | 13.20 | 13.20–13.50 |
| Seattle | 7.05 | 8.60 | 9.20 | 9.05 | ..... | 6.75 | 6.65 | 6.75 | 9.05 | ..... | ..... | ..... | ..... |
| St. Louis | 5.80–5.85 | 6.65 | 8.00 | 5.80 | 8.00[4]–8.28 | 6.13 | 6.03 | 5.80 | 6.55–6.65 | 10.05 | 10.35 | 11.70 | 12.00 |
| St. Paul* | 6.16 | 6.96 | 8.31 | 6.11 | ..... | 6.36 | 6.26 | 6.11 | 6.96 | 10.36 | 10.66 | 12.01 | 12.31 |

BASE QUANTITIES (Standard unless otherwise keyed): Cold finished bars; 2000 lb or over. Alloy bars; 1000 to 1999 lb. All others; 2000 to 9999 lb. All HR products may be combined for quantity. All galvanized sheets may be combined for quantity. CR sheets may not be combined with each other or with galvanized sheets, for quantity.

EXCEPTIONS: (1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 400 to 1999 lb; (4) 6000 lb and over; (5) 1500 to 9999 lb; (6) 2000 to 5999 lb.

## PIG IRON

Dollars per gross ton, f.o.b., subject to switching charges.

| Producing Point | Basic | Foundry | Malleable | Bessemer | Low Phos. | Blast Furnace Silvery | Low Phos. Charcoal |
|---|---|---|---|---|---|---|---|
| Bethlehem-3 | 54.00 | 54.50 | 55.00 | 55.50 | ..... | ..... | ..... |
| Birmingham-4 | 48.38 | 48.88 | ..... | ..... | ..... | ..... | ..... |
| Birmingham-91 | 48.38 | 48.88 | ..... | ..... | ..... | ..... | ..... |
| Birmingham-92 | 48.38 | 48.88 | ..... | ..... | ..... | ..... | ..... |
| Buffalo-4 | 52.00 | 52.50 | 53.00 | ..... | ..... | ..... | ..... |
| Buffalo-93 | 52.00 | 52.50 | 53.00 | ..... | ..... | 63.75 | ..... |
| Chicago-94 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Cleveland-2 | 52.00 | 52.50 | 52.50 | 53.00 | 57.00 | ..... | ..... |
| Cleveland-4 | 52.00 | 52.50 | 52.50 | ..... | ..... | ..... | ..... |
| Daingerfield, Tex.-95 | 48.00 | 48.50 | 48.50 | ..... | ..... | ..... | ..... |
| Duluth-94 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Erie-94 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Everett, Mass.-96 | ..... | 55.25 | 55.75 | ..... | ..... | ..... | ..... |
| Fontana-19 | 58.00 | 58.50 | ..... | ..... | ..... | ..... | ..... |
| Geneva, Utah-16 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Granite City, Ill.-102 | 53.90 | 54.40 | 54.90 | ..... | ..... | ..... | ..... |
| Hubbard, Ohio-6 | 52.00 | 52.50 | 52.50 | ..... | ..... | ..... | ..... |
| Ironton, Utah-16 | 52.00 | 52.50 | ..... | ..... | ..... | ..... | ..... |
| Jackson, Ohio-97, 98 | ..... | ..... | ..... | ..... | ..... | 62.50 | ..... |
| Lyle, Tenn.-101 | ..... | ..... | ..... | ..... | ..... | ..... | 66.00 |
| Monessen-18 | 54.00 | ..... | ..... | ..... | ..... | ..... | ..... |
| Neville Island-99 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Pittsburgh-1 | 52.00 | ..... | ..... | 53.00 | ..... | ..... | ..... |
| Sharpsville-100 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Steelton-3 | 54.00 | 54.50 | 55.00 | 55.50 | 60.00 | ..... | ..... |
| Swedeland-26 | 56.00 | 56.50 | 57.00 | 57.50 | ..... | ..... | ..... |
| Toledo-94 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| Troy, N. Y.-4 | 54.00 | 54.50 | 55.00 | ..... | 60.00 | ..... | ..... |
| Youngstown-6 | 52.00 | 52.50 | 52.50 | 53.00 | ..... | ..... | ..... |
| N. Tonawanda, N. Y.-105 | ..... | 52.50 | 53.00 | ..... | ..... | ..... | ..... |

DIFFERENTIALS: Add 50¢ per ton for each 0.25 pct silicon over base (1.75 to 2.25 pct, except low phos. 1.75 to 2.00 pct), 50¢ per ton for each 0.50 pct manganese over 1 pct, $2 per ton for 0.5 to 0.75 pct nickel, $1 for each additional 0.25 pct nickel. Subtract 38¢ per ton for phosphorus, content 0.70 pct and over. Silvery Iron: Add $1.50 per ton for each 0.50 pct silicon over base (6.01 to 6.50 pct) up to 17 pct. $1 per ton for 0.75 pct or more phosphorus, manganese as above. Bessemer ferrosilicon prices are $1 over comparable silvery iron.

## REFRACTORIES

**Fire Clay Brick** *(F.o.b. works) Carloads, Per 1000*

| | |
|---|---|
| First quality, Ill., Ky., Md., Mo., Ohio, Pa. (except Salina, Pa., add $5) | $94.60 |
| No. 1 Ohio | 88.00 |
| Sec. quality, Pa., Md., Ky., Mo., Ill. | 88.00 |
| No. 2 Ohio | 79.20 |
| Ground fire clay, net ton, bulk (except Salina, Pa., add $1.50) | 13.75 |

**Silica Brick**

| | |
|---|---|
| Mt. Union, Pa., Ensley, Ala. | $94.60 |
| Childs, Pa. | 99.00 |
| Hays, Pa. | 100.10 |
| Chicago District | 104.50 |
| Western Utah and Calif. | 111.10 |
| Super Duty, Hays, Pa., Athens, Tex., Chicago | 111.10 |
| Silica cement, net ton, bulk, Eastern (except Hays, Pa.) | 16.50 |
| Silica cement, net ton, bulk, Hays, Pa. | 18.70 |
| Silica cement, net ton, bulk, Ensley, Ala. | 17.60 |
| Silica cement, net ton, bulk, Chicago District | 17.60 |
| Silica cement, net ton, bulk, Utah and Calif. | 24.70 |

**Chrome Brick** *Per Net Ton*

| | |
|---|---|
| Standard chemically bonded, Balt., Chester | $82.00 |

**Magnesite Brick**

| | |
|---|---|
| Standard, Baltimore | $104.00 |
| Chemically bonded, Baltimore | 93.00 |

**Grain Magnesite** *St. ⅜-in. grains*

| | |
|---|---|
| Domestic, f.o.b. Baltimore, in bulk fines removed | $62.70 |
| Domestic, f.o.b. Chewelah, Wash., in bulk | 36.30 |
| in sacks | 41.80 |

**Dead Burned Dolomite**

| | |
|---|---|
| F.o.b. producing points in Pennsylvania, West Virginia and Ohio, per net ton, bulk Midwest, add 10¢; Missouri Valley, add 20¢ | $13.00 |

## COKE

| | Net Ton |
|---|---|
| Furnace, beehive (f.o.b. oven) Connellsville, Pa. | $14.50 to $15.00 |
| Foundry, beehive (f.o.b. oven) Connellsville, Pa. | $17.50 to $18.00 |
| Foundry, oven coke | |
| Buffalo, del'd | $26.69 |
| Chicago, f.o.b. | 23.00 |
| Detroit, f.o.b. | 24.00 |
| New England, del'd | 24.80 |
| Seaboard, N. J., f.o.b. | 22.75 |
| Philadelphia, f.o.b. | 22.70 |
| Swedeland, Pa., f.o.b. | 22.60 |
| Painesville, Ohio, f.o.b. | 24.00 |
| Erie, Pa., f.o.b. | 23.50 |
| Cleveland, del'd | 25.72 |
| Cincinnati, del'd | 25.06 |
| St. Paul, f.o.b. | 22.50 |
| St. Louis | 25.40 |
| Birmingham, del'd | 21.69 |
| Neville Island | 23.00 |

## LAKE SUPERIOR ORES

(51.50% *Fe; natural content, delivered lower lake ports*) *Per gross ton*

| | |
|---|---|
| Old range, bessemer | $8.70 |
| Old range, nonbessemer | 8.55 |
| Mesabi, bessemer | 8.45 |
| Mesabi, nonbessemer | 8.30 |
| High phosphorus | 8.30 |

After adjustments for analyses, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

## C-R SPRING STEEL

| F.o.b. Mill Cents Per Lb. | CARBON CONTENT | | | | |
|---|---|---|---|---|---|
| | 0.26–0.40 | 0.41–0.60 | 0.61–0.80 | 0.81–1.05 | 1.06–1.35 |
| Bridgeport, Conn.-58 | 5.35 | 6.80 | 7.40 | 9.35 | 11.65 |
| Carnegie, Pa.-41 | ..... | 6.80 | 7.40 | 9.35 | 11.65 |
| Cleveland-2 | 4.65 | 6.45 | 7.40 | 9.35 | 11.65 |
| Detroit-58 | 5.60 | 6.65 | 7.25 | ..... | ..... |
| New Castle, Pa.-40 | 5.35 | 6.80 | 7.40 | 9.35 | ..... |
| New Haven, Conn.-68 | 5.85 | 6.75 | 7.35 | ..... | ..... |
| Sharon, Pa.-13 | 5.35 | 6.80 | 7.40 | 9.35 | 11.65 |
| Weirton, W. Va.-9 | 5.35 | 6.80 | 7.40 | 9.35 | 11.65 |
| Worcester, Mass.-2 | 4.95 | 6.75 | 7.70 | 9.65 | 11.65 |
| Youngstown-48 | ..... | 6.80 | 7.40 | 9.35 | 11.65 |

## BOLTS, NUTS, RIVETS, SCREWS

### Consumer Prices

*(Base discount, f.o.b. mill, Pittsburgh, Cleveland, Birmingham or Chicago)*

**Machine and Carriage Bolts**

| | Pct Off List | |
|---|---|---|
| | Less Case | C. |
| ½ in. & smaller x 6 in. & shorter | 15 | 28½ |
| 9/16 in. & ⅝ in. x 6 in. & shorter | 18½ | 30½ |
| ¾ in. & larger x 6 in. & shorter | 17½ | 29½ |
| All diam. longer than 6 in. | 14 | 27½ |
| Lag, all diam. x 6 in. & shorter | 23 | 35 |
| Lag, all diam. longer than 6 in. | 31 | 33 |
| Plow bolts | 34 | .... |

**Nuts, Hot Pressed, Cold Punched—Sq**

| | Pct Off List | | | |
|---|---|---|---|---|
| | Less Keg (Reg.) | K. | Less Keg (Hvy.) | K. |
| ½ in. & smaller. | 15 | 28½ | 15 | 28½ |
| 9/16. in. & ⅝ in.. | 12 | 25 | 6½ | 21 |
| ¾ in. to 1½ in. inclusive | 9 | 23 | 1 | 16½ |
| 1⅝ in. & larger. | 7½ | 22 | 1 | 16½ |

**Nuts, Hot Pressed—Hexagon**

| | | | | |
|---|---|---|---|---|
| ½ in. & smaller. | 26 | 37 | 22 | 34 |
| 9/16 in. & ⅝ in.. | 16½ | 29½ | 6½ | 21 |
| ¾ in. to 1½ in. inclusive | 12 | 25 | 2 | 17½ |
| 1⅝ in. & larger. | 8½ | 23 | 2 | 17½ |

**Nuts, Cold Punched—Hexagon**

| | | | | |
|---|---|---|---|---|
| ½ in. & smaller. | 26 | 37 | 22 | 34 |
| 9/16 in. & ⅝ in.. | 23 | 35 | 17½ | 30½ |
| ¾ in. to 1½ in. inclusive | 19½ | 31½ | 12 | 25 |
| 1⅝ in. & larger. | 12 | 25 | 6½ | 21 |

**Nuts, Semi-Finished—Hexagon**

| | Reg. | | Hvy. | |
|---|---|---|---|---|
| ½ in. & smaller. | 35 | 45 | 28½ | 39½ |
| 9/16 in. & ⅝ in.. | 29½ | 40½ | 22 | 34 |
| ¾ in. to 1½ in. inclusive | 24 | 36 | 15 | 28½ |
| 1⅝ in. & larger. | 13 | 26 | 8½ | 23 |

| | Light | |
|---|---|---|
| 7/16 in. & smaller | 35 | 45 |
| ½ in. thru ⅝ in. | 28½ | 39½ |
| ¾ in. to 1½ in. inclusive | 26 | 37 |

**Stove Bolts** — *Pct Off List*

Packaged, steel, plain finished 45—10
Packaged, plated finish 31—10
Bulk, plain finish** 62*

*Discounts apply to bulk shipments in not less than 15,000 pieces of a size and kind where length is 3-in. and shorter; 5000 pieces for lengths longer than 3-in. For lesser quantities, packaged price applies.

**Zinc, Parkerized, cadmium or nickel plated finishes add 6¢ per lb net. For black oil finish, add 2¢ per lb net.

**Rivets** — *Base per 100 lb.*

½ in. & larger $7.85

*Pct Off List*

7/16 in. & smaller 36

F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham, Lebanon, Pa.

**Cap and Set Screws**

*(In bulk)* — *Pct Off List*

Hexagon head cap screws, coarse or fine thread, ¼ in. thru ⅝ in. x 6 in., SAE 1020, bright 54
¾ in. thru 1 in. up to & including 6 in. 48
¼ in. thru ⅝ in. x 6 in. & shorter high C double heat treat 46
¾ in. thru 1 in. up to & including 6 in. 41
Milled studs 35
Flat head cap screws, listed sizes 16
Fillister head cap, listed sizes 34
Set screws, sq head, cup point, 1 in. diam and smaller x 6 in. & shorter 53

**S. M. Ferrochrome**

Contract price, cents per pound, chromium contained, lump size, delivered.

High carbon type: 60-65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.

| | |
|---|---|
| Carloads | 21.60 |
| Ton lots | 23.75 |
| Less ton lots | 25.25 |

Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.

| | |
|---|---|
| Carloads | 27.75 |
| Ton lots | 30.05 |
| Less ton lots | 31.85 |

## ELECTRODES

*Cents per lb., f.o.b. plant threaded electrodes with nipples, unboxed*

| Diam. in in. | Length in in. | Cents Per lb. |
|---|---|---|
| | GRAPHITE | |
| 17, 18, 20 | 60, 72 | 17.85 |
| 8 to 16 | 48, 60, 72 | 17.85 |
| 7 | 48, 60 | 19.57 |
| 6 | 48, 60 | 20.95 |
| 4, 5 | 40 | 21.50 |
| 3 | 40 | 22.61 |
| 2½ | 24, 30 | 23.15 |
| 2 | 24, 30 | 25.36 |
| | CARBON | |
| 40 | 100, 110 | 8.03 |
| 35 | 65, 110 | 8.03 |
| 30 | 65, 84, 110 | 8.03 |
| 24 | 72 to 104 | 8.03 |
| 20 | 84, 90 | 8.03 |
| 17 | 60, 72 | 8.03 |
| 14 | 60, 72 | 8.57 |
| 10, 12 | 60 | 8.84 |
| 8 | 60 | 9.10 |

## CLAD STEEL

*Base prices, cents per pound, f.o.b. mill*

| Stainless-carbon | Plate | Sheet |
|---|---|---|
| No. 304, 20 pct. | | |
| Coatesville, Pa. (21) | *29.5 | |
| Washgtn, Pa. (39) | *29.5 | |
| Claymont, Del. (29) | *28.00 | |
| Conshohocken, Pa. (26) | | *27.50 |
| New Castle, Ind. (55) | *26.50 | *25.50 |
| Nickel-carbon | | |
| 10 pct Coatesville (21) | 32.5 | |
| Inconel-carbon | | |
| 10 pct Coatesville (21) | 40.5 | |
| Monel-carbon | | |
| 10 pct Coatesville (21) | 33.5 | |
| No. 302 Stainless-copper stainless, Carnegie, Pa. (60) | | 77.00 |
| Aluminized steel sheets, hot dip, Butler, Pa. (7) | | 7.75 |

*Includes annealing and pickling, or sandblasting.

## TOOL STEEL

*F.o.b. mill*

| W | Cr | V | Mo | Co | Base per lb |
|---|---|---|---|---|---|
| 18 | 4 | 1 | — | — | $1.505 |
| 18 | 4 | 1 | — | 5 | $2.13 |
| 18 | 4 | 2 | — | — | $1.65 |
| 1.5 | 4 | 1.5 | 8 | — | 81.0¢ |
| 6 | 4 | 2 | 6 | — | 96.5¢ |

| | |
|---|---|
| High-carbon chromium | 63.5¢ |
| Oil hardened manganese | 35¢ |
| Special carbon | 32.5¢ |
| Extra carbon | 27¢ |
| Regular carbon | 23¢ |

Warehouse prices on and east of Mississippi are 3.5¢ per lb higher. West of Mississippi, 5.5¢ higher.

## METAL POWDERS

*Per pound, f.o.b. shipping point, in ton lots, for minus 100 mesh.*

| | |
|---|---|
| Swedish sponge iron c.l.f. New York, ocean bags | 7.4¢ to 9.0¢ |
| Canadian sponge iron, del'd In East | 10.00¢ |
| Domestic sponge iron, 98+% Fe, carload lots | 15.5¢ to 17.0¢ |
| Electrolytic iron, annealed, 99.5+% Fe | 42.5¢ |
| Electrolytic iron, unannealed, minus 325 mesh, 99+% Fe | 53.5¢ |
| Hydrogen reduced iron, minus 300 mesh, 98+% Fe | 63.0¢ to 80.0¢ |
| Carbonyl iron, size 5 to 10 micron, 98%, 99.8+% Fe | 83.0¢ to $1.48 |
| Aluminum | 31.5¢ |
| Brass, 10 ton lots | 30.00¢ to 33.25¢ |
| Copper, electrolytic | 10.75¢ plus metal value |
| Copper, reduced | 10.00¢ plus metal value |
| Cadmium, 100-199 lb | 95¢ plus metal value |
| Chromium, electrolytic, 99% min., and quantity, del'd | $3.50 |
| Lead | 7.5¢ to 12.0¢ plus metal value |
| Manganese | 57.0¢ |
| Molybdenum, 99% | $2.75 |
| Nickel, unannealed | 88.0¢ |
| Nickel, annealed | 95.0¢ |
| Nickel, spherical, unannealed | 92.0¢ |
| Silicon | 38.5¢ |
| Solder powder | 7.0¢ to 9.0¢ plus met. value |
| Stainless steel, 302 | 83.00¢ |
| Stainless steel, 316 | $1.10 |
| Tin | 14.00¢ plus metal value |
| Tungsten, 99% (65 mesh) | $6.00 |
| Zinc, 10 ton lots | 23.0¢ to 30.5¢ |

## ELECTRICAL SHEETS

22 Ga. H-R cut lengths

| F.o.b. Mill Cents Per Lb. | Armature | Elec. | Motor | Dynamo | Transf. 72 | Transf. 65 | Transf. 58 |
|---|---|---|---|---|---|---|---|
| Beech-Bottom-15 | .... | 7.25 | 8.50 | 9.30 | 9.85 | 10.40 | 11.10 |
| Brackenridge-28 | .... | 7.25 | 8.50 | 9.30 | 9.85 | .... | .... |
| Follansbee-63 | 6.75 | 7.25 | 8.50 | 9.30 | 9.85 | 10.40 | 11.10 |
| Granity City-22 | .... | 7.95 | 9.20 | .... | .... | .... | .... |
| Ind. Harbor-3 | 6.75 | 7.25 | .... | .... | .... | .... | .... |
| Mansfield-75 | 7.25 | 7.75 | 9.00 | 9.60 | .... | .... | .... |
| Niles, O.-84 | 7.05 | 7.55 | .... | .... | .... | .... | .... |
| Vandergrift-1 | 6.75 | 7.25 | 8.50 | 9.30 | 9.85 | 10.40 | 11.10 |
| Warren, O.-4 | 6.75 | 7.25 | 8.50 | 9.30 | 9.85 | 10.40 | 11.10 |
| Zanesville-7 | 6.75 | 7.25 | 8.50 | 9.30 | 9.85 | 10.40 | 11.10 |

**Ferrochrome**

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered. (65-72% Cr, 2% max. Si.)

| | | | |
|---|---|---|---|
| 0.06% C | 30.50 | 0.30% C | 29.50 |
| 0.10% C | 30.00 | 0.50% C | 29.25 |
| 0.15% C | 29.75 | 1.00% C | 29.00 |
| 2.00% C | | | 28.75 |
| 65-69% Cr, 4-9% C | | | 23.00 |
| 62-66% Cr, 4-6% C, 6-9% Si. | | | 23.60 |

**Foundry Ferrochrome**

Contract prices, cents per lb of alloy. Noncontract prices add 2.50¢ per lb.

High carbon 8 Mesh and down.

62 to 66% Cr, 5 to 7% C, 7 to 10% Si.

| | |
|---|---|
| Carloads, bulk | 23.25 |
| Carloads, packed | 24.15 |
| Ton lots, packed | 27.25 |

**High-Nitrogen Ferrochrome**

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.

**Chromium Metal**

Contract prices, per lb chromium contained, packed, delivered, ton lots. 97% min. Cr, 1% max. Fe.

| | |
|---|---|
| 0.10% max. C. | $1.14 |
| 0.50% max. C. | 1.10 |
| 9 to 11% C. | 1.08 |

**Low Carbon Ferrochrome Silicon**

(Cr 34-41%, Si 42-49%, C 0.05% max.) Contract price, carloads, f.o.b. Niagara Falls, freight allowed; lump 4-in. x down, bulk 2-in. x down, 21.75¢ per lb of contained Cr plus 12.00¢ per lb of contained Si.

Bulk 1-in. x down, 21.90¢ per lb contained Cr plus 12.20¢ per lb contained Si.

**Calcium-Silicon**

Contract price per lb of alloy, dump, delivered.

30-33% Ca, 60-65% Si, 3.00% max. Fe.

| | |
|---|---|
| Carloads | 19.00 |
| Ton lots | 22.10 |
| Less ton lots | 23.60 |

**Calcium-Manganese—Silicon**

Contract prices, cents per lb of alloy, lump, delivered.

16-20% Ca, 14-18% Mn, 53-59% Si.

| | |
|---|---|
| Carloads | 20.00 |
| Ton lots | 22.30 |
| Less ton lots | 23.30 |

**V Foundry Alloy**

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.

| | |
|---|---|
| Ton lots | 16.50¢ |
| Less ton lots | 17.75¢ |

**Graphidox No. 4**

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. Si 48 to 52%, Ti 9 to 11%, Ca 5 to 7%.

| | |
|---|---|
| Carload packed | 18.00¢ |
| Ton lots to carload packed | 19.00¢ |
| Less ton lots | 20.50¢ |

**SMZ**

Contract price, cents per pound of alloy, delivered, 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.

| | |
|---|---|
| Ton lots | 17.50 |
| Less ton lots | 19.50 |

## FERROALLOYS

**Ferromanganese**

78-82% Mn, maximum contract base price, gross ton, lump size.
f.o.b. Niagara Falls, Alloy, W. Va., Welland, Ont., Ashtabula, O. ..... $185
f.o.b. Johnstown, Pa. ..... $187
f.o.b. Sheridan, Pa. ..... $185
f.o.b. Etna, Clairton, Pa. ..... $188
$2.00 for each 1% above 82% Mn, penalty, $2.15 for each 1% below 78%.
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.
Carload, bulk ..... 10.95
Ton lots ..... 12.55

**Spiegeleisen**

Contract prices gross ton, lump, f.o.b.

| | 16-19% Mn 3% max. Si | 19-21% Mn 3% max. Si |
|---|---|---|
| Palmerton, Pa. | $74.00 | $75.00 |
| Pgh. or Chicago | 75.00 | 76.00 |

**Manganese Metal**

Contract basis, 2 in. x down, cents per pound of metal, delivered.
96% min. Mn, 0.2% max. C, 1% max. Si, 2.5% max. Fe.
Carload, packed ..... $4.75
Ton lots ..... 36.25

**Electrolytic Manganese**

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.
Carloads ..... 28
Ton lots ..... 30
Less ton lots ..... 32

**Medium Carbon Ferromanganese**

Mn 80% to 85%, C 1.25 to 1.50. Contract price, carloads, lump, bulk, delivered, per lb. of contained Mn ..... 19.15¢

**Calcium Metal**

Eastern zone contract prices, cents per pound of metal, delivered.

| | Cast | Turnings | Distilled |
|---|---|---|---|
| Ton lots ..... | $2.05 | $2.95 | $3.75 |
| Less ton lots.. | 2.40 | 3.30 | 4.55 |

**Silicomanganese**

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.
Carload bulk ..... 9.90
Ton lots ..... 11.55
Briquet, contract basis carlots, bulk delivered, per lb of briquet ..... 11.15
Ton lots ..... 12.75

**Silvery Iron (electric furnace)**

Si 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, or Wenatchee, Wash., $92.50 gross ton, freight allowed to normal trade area. Si 15.01 to 15.50 pct, f.o.b. Niagara Falls, N. Y., $90.00. Add $1.00 per ton for each additional 0.50% Si up to and including 18%. Add $1.00 for each 0.50% Mn over 1%.

**Silicon Metal**

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.
96% Si, 2% Fe ..... 21.70
97% Si, 1% Fe ..... 22.10

**Silicon Briquets**

Contract price, cents per pound of briquet bulk, delivered, 40% Si, 2 lb Si briquets.
Carload, bulk ..... 6.95
Ton lots ..... 8.55

**Electric Ferrosilicon**

Contract price, cents per pound contained Si, lump, bulk, carloads, delivered.

| | | | |
|---|---|---|---|
| 25% Si..... | 20.00 | 75% Si..... | 14.30 |
| 50% Si..... | 12.40 | 85% Si..... | 15.55 |
| 90-95% Si ..... | | | 17.50 |

**Low-Carbon Ferromanganese**

Contract price, cents per pound Mn contained, lump size, del'd, Mn 85-90%.

| | Carloads | Ton | Less |
|---|---|---|---|
| 0.75% max. C, 0.06% P, 90% Mn..... | 26.25 | 28.10 | 29.30 |
| 0.07% max. C..... | 25.75 | 27.60 | 28.80 |
| 0.15% max. C..... | 25.25 | 27.10 | 28.30 |
| 0.20% max. C..... | 24.75 | 26.60 | 27.80 |
| 0.50% max. C..... | 24.25 | 26.10 | 27.30 |
| 0.75% max. C, 7.00% max. Si..... | 21.25 | 23.10 | 24.30 |

For other ferroalloys see May 24 issue, p. 160.


The ABC of MST

Michigan Electric Resistance WELDED STEEL TUBING

A ALWAYS MAKES POSSIBLE
B BETTER PRODUCTS AT
C COST

A Quality Product

ROUND

⅜" to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR

½" to 2" 20 gauge, 1" to 2¾", 14, 16, 18 gauge

Carbon 1010 to 1025

Michigan Tubing has uniform strength, weight, ductility, I. D. and O. D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Consult us for engineering and technical help in the selection of tubing best suited to your needs.

We Did It Before...

We rolled up our sleeves before and the whole world was amazed at the miracle of American production. Now we're at it again and Michigan is proud to be doing its share in this great defense effort.

Michigan electric resistance welded steel tubing found its way into numerous products for the armed forces during World War II, such as automobiles, trucks, incendiary bombs, and airplanes. Another use was invasion line tubing. Design simplification and adaptability, qualities making for economical and faster production, were among the reasons why so many manufacturers turned to Michigan tubing.

As we "do it again" during the present defense emergency, consider how Michigan tubing can be applied to your product. We'll appreciate the opportunity of discussing its use, whether for defense or consumer items.

Michigan ELECTRIC RESISTANCE WELDED STEEL TUBING STEEL TUBE PRODUCTS CO.

THE OLDEST NAME IN

More Than 30 Years in the Business

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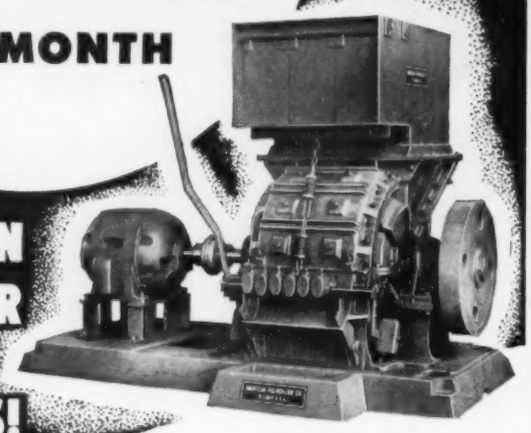
IF
YOUR
METAL TURNINGS
AMOUNT TO
20 TONS OR MORE
PER MONTH

AN AMERICAN
METAL TURNINGS CRUSHER
can bring you
NEW PROFITS!



AMERICAN #2400
METAL TURNINGS CRUSHER

A chip salvage system, with an American Metal Turnings Crusher at the core, can help you realize new savings and profits in metal, oil, man-hours, factory space, and tool maintenance. Consider these typical money-saving, money-making advantages of an American installation:

(1) **Brings $3 to $4 more per ton for chips** than for long machine shop turnings,

(2) **Reclaims 30 to 50 gallons of cutting oil per ton,**

(3) **Prolongs tool life** through more liberal use of recovered oil,

(4) **Saves 75% storage space** . . . permits heavier freight car loads . . . cuts shipping costs,

(5) **Easier, faster handling,**

(6) **Easier briquetting,** so essential for foundry and steel mill use.

**THIS COULD BE YOUR PROFIT STORY FOR NEXT YEAR!**

240 Tons Metal Turnings Per Year .....$ 960.00 Per Year
(20 tons per month at $4 extra per ton)

3600 Gallons Cutting Oil Recovery at 30¢ Per Gallon ...$1,080.00 Per Year
(30 gallons per ton x 240 tons = 7200 gallons. Half of this, 3600 gallons, can be credited to use of chips instead of long turnings.)

Estimated Savings on Manpower, Storage, Tool Maintenance, Freight, etc. .....$ 300.00 Per Year

TOTAL GROSS PROFIT
(Resulting from an American Installation).....$2,340.00 Per Year

*WRITE for American Rolling Ring Metal Turnings Crusher Bulletin.*

American PULVERIZER COMPANY
*Originators and Manufacturers of Ring Crushers and Pulverizers*
1439 MACKLIND AVE.
ST. LOUIS 10, MO.




**Other Ferroalloys**

Alsifer, 20%, Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.
Carload .....
Ton lots ..... 9.50¢ 11.50¢
Calcium molybdate, 45-40%, f.o.b. Langeloth, Pa., per pound contained Mo. .....
Ferrocolumbium, 50-60%, 2 in. x D, contract basis, delivered, per pound contained Cb.
Ton lots ..... $4.50
Less ton lots ..... 4.85
Ferro-Tantalum-columbium, 20% Ta, 40% Cb, 0.30 C. Contract basis, delivered, ton lots, 2 in. x D, per lb of contained Cb plus Ta
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo. .....
Ferrophosphorus, electrolytic, 23-26%, car lots, f.o.b. Siglo, Mt. Pleasant, Tenn., $3 unitage, per gross ton ..... $65.00
10 tons to less carload ..... 75.00
Ferrotitanium, 40%, regular grade, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa. freight allowed, ton lots, per lb contained Ti .....
Ferrotitanium, 25%, low carbon, 0.10% C max., f.o.b. Niagara Falls, N. Y., and Bridgeville, Pa., freight allowed, ton lots, per lb contained Ti ..... $1.50
Less ton lots ..... 1.60
Ferrotitanium, 15 to 18%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed, carload per net ton ..... $177.00
Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered ..... $5.00
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained V.
Openhearth ..... $3.00-$3.10
Crucible ..... 3.10- 3.20
High speed steel (Primos) 3.20- 3.35
Molybdic oxide, briquets or cans, per lb contained Mo, f.o.b Langeloth, Pa. ..... $1.14
bags, f.o.b. Washington, Pa., Langeloth, Pa. ..... $1.13
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound
Carload, bulk lump ..... 14.50¢
Ton lots, bulk lump ..... 15.75¢
Less ton lots, lump ..... 16.25¢
Vanadium pentoxide, 86 to 89% $V_2O_5$ contract basis, per pound contained $V_2O_5$ ..... $1.32
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.
Ton lots ..... 21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per lb of alloy.
Carload, bulk ..... 7.00¢

**Boron Agents**

Contract prices per lb of alloy, del.
Borosil, f.o.b. Philo, Ohio, freight allowed, B, 3-4%, Si, 40-45%, per lb contained B ..... $5.25
Bortam, f.o.b. Niagara Falls
Ton lots, per pound ..... 45¢
Less ton lots, per pound ..... 50¢
Carbortam, Ti, 15-21%, B, 1-2%, Si, 2-4%, Al, 1-2%, C, 4.5-7.5%, f.o.b. Suspension Bridge, N. Y., freight allowed.
Ton lots, per pound..... 10.00¢
Ferroboron, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lots..... $1.30
F.o.b. Wash., Pa.; 100 lb up .55
10 to 14% B..... 1.35
14 to 19% B..... 1.50
19% min. B.....
Grainal, f.o.b Bridgeville, Pa., freight allowed, 100 lb and over.
No. 1 ..... $1.00
No. 6 ..... 65¢
No. 79 ..... 50¢
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, del'd
Ton lots ..... $1.45
Less ton lots ..... 1.57
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.
Less ton lots ..... $1.80
Silcaz, contract basis, delivered.
Ton lots ..... 45.00¢

# Bright chapter in the West's growth

A NEW MILL to produce tinplate—critically needed by western can manufacturers—is now under construction by Kaiser Steel.

Scheduled for completion next year, it will add 200,000 tons of tinplate to the West's annual supply—enough for 2 billion cans a year.

This tinplate mill will help greatly to meet the urgent needs of the West's multi-million dollar produce industry. It will provide sorely needed metal to protect military provisions.

This is another chapter in a *continuous* story of expansion by Kaiser Steel . . . resulting in greater production of finished steels listed below. Today, this steel is helping in countless ways to supply military and essential civilian requirements.

More evidence that the West Coast's only integrated, *independent* steel plant is helping to build a stronger West . . . and a stronger nation!

***It's good business to do business with***

# Kaiser Steel

***built to serve the West***

**PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES** • plates • continuous weld pipe • electric weld pipe • hot rolled strip • hot rolled sheet • alloy bars • carbon bars • structural shapes • cold rolled strip • cold rolled sheet • special bar sections • semi-finished steels • pig iron • coke oven by-products

For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

MATERIAL HANDLING *News*

# Read 'em and REAP

**SAFETY SAVES!**
Cartoons and a light touch sell the idea that **safe** operation and good care of materials-handling equipment pay off for company **and** operator. Pocket size. Available in quantity.

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For a clear understanding of modern handling principles and practices, have your entire staff read this one. Pocket size.

**CONDENSED CATALOG**
A complete, compact showing and basic specifications of the Clark Leadership Line—fork-lift trucks, industrial towing tractors, powered hand trucks and special handling attachments.

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Clark movies enable you to **see** at your convenience modern machines in action. Synopses of films widely rated "the best in the materials-handling field," and how to borrow them.

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• *News of Industry* •

## Manganese Welcome Mat Put Out at Three New Depots in West

Needed manganese ore will be made welcome at three new General Services Administration depots in the West. Establishment of the manganese "ports" is part of the continuing GSA program to promote discovery of new deposits.

Depots will be located at Butte and Philipsburg, Mont., and at Deming, New Mexico. The minimum for a single delivery will be 5 long tons. Prices will be based on manganese content of the ore.

Ore brought to Butte must contain a minimum of 12 pct manganese and prices will range from $6.05 per long ton dry to $40.42 for 30 pct content.

Minimum content for Philipsburg and Deming will be 15 pct manganese. At Philipsburg, minimum-content ore will bring $6.43 per ton, while 30 pct ore is valued at $34.81. Prices at Deming will range from $6.10 for 15 pct ore to $76 for ore with 40 pct manganese content.

Establishment of the domestic purchase plan was recommended to GSA by Defense Minerals Administration, with approval of Defense Production Administration.

## U.S. Endorses Schumann Plan

Endorsement for the Schumann Plan to pool coal and steel resources in Western Europe is contained in a new State Dept. leaflet. The program for consolidating fundamental materials to augment industrial production is called an indication of "far-seeing statesmanship."

The department's comment on the plan is that it "can provide a solid base upon which Europeans can build a new and peaceful Europe."

## Rail Loan to Spain

Export-Import Bank has loaned $7.5 million to the Spanish national railways system. The loan will be used to buy rails and accessories, signal equipment, electric locomotives, substations, and other related equipment.

Take the GUESSWORK OUT OF YOUR MACHINING OPERATIONS

WITH WYCKOFF CONTROLLED BAR STOCK CARBON AND ALLOY

the COLD FINISHED STEEL

THAT PERFORMS THE SAME ON YOUR MACHINE
... EVERY LOT ...
... EVERY DAY!

LET WYCKOFF WORK WITH YOU IN DETERMINING THE BEST STEEL STRUCTURES FOR YOUR MACHINE OPERATIONS

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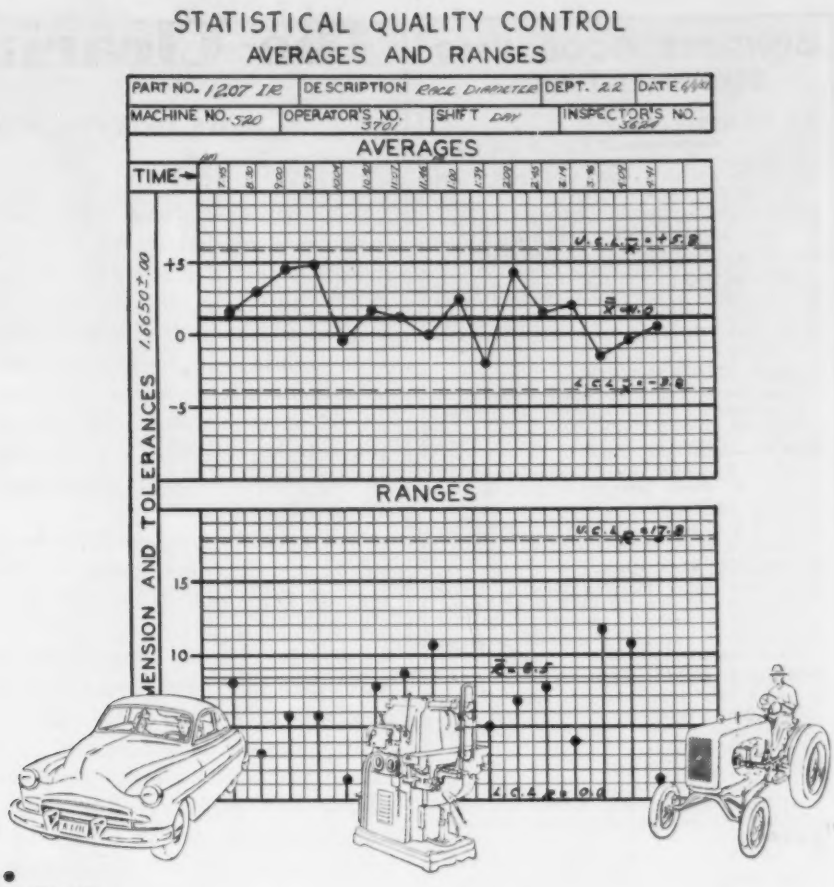



# Beating Friction... with Statistical Quality Control

Control of quality *has* to be the code of production in making of ball bearings to meet precise performance standards. Federal—a consistent supplier to the automotive industry for thirty-five years—makes statistical quality control an integral part of its production. The result: ball bearings that are helping automotive engineers, machine-tool builders, agricultural equipment designers, textile manufacturers develop high-performance products.

Close-tolerance manufacture demands close control of production, and a constant awareness of new techniques. For example, Federal's comprehensive statistical quality-control program maintains rigid watchdog inspection on every ball bearing, gears production to the exacting demands of bearing engineers. That's why Federal—the *experienced* ball bearing-maker—can help you eliminate friction, improve product performance.

Every Federal ball bearing is a product of the combined skills of IMAGINATIVE RESEARCH • ADVANCED ENGINEERING • ALERT MANUFACTURING • RIGID QUALITY CONTROL • SUPER-PRECISE TESTING.

THE FEDERAL BEARINGS CO., INC.
POUGHKEEPSIE, NEW YORK

*Makers of Fine Ball Bearings*

Quality
Since 1908

**Federal** BALL BEARINGS

ONE OF AMERICA'S LEADING BALL BEARING MANUFACTURERS

## CONSIDER GOOD USED EQUIPMENT FIRST

**AIR COMPRESSORS**
2873 cu. ft. Worthington 29 x 21" & 18½ x 21". Complete with Elec. Equipment
1480 cu. ft. Worthington 23" & 14 x 16". With 300 H.P. Syn Motor 4160/3/60

**BOLT THREADING MACHINE**
⅞" Acme 2-Spindle—With Landis Head

**CRANES—OVERHEAD ELECTRIC TRAVELING**
10 ton Milwaukee 89'5" Span 220/3/60. With two 5 ton trolleys
10 ton Case 100' Span 220/3/60. With two 5 ton Trolleys

**CRANE—ROUSTABOUT**
Hughes Keenan Roustabout Crane Model MC-4 25' Gooseneck Boom, Mounted on Tractor. Equipped with pneumatic tires

**CRANE—LOCOMOTIVE**
Industrial Brownhoist Type B Steam Locomotive Crane, 50' Boom. New Boiler installed 1946

**CRANE TROLLEY**
50 ton P & H Trolley with 15 & 37 H.P. Motors 220 volt 3 phase 60 cycle

**FLANGING MACHINE**
No. 6 Blue Valley Flanging Machine, Motor Driven With 15 H.P. 220/440 Volt AC Motor. Capacity ⅝" material from 30" to 20' flat heads and ¾" material 6' diameter or larger dished heads

**FORGING MACHINES**
2" AJAX New Model Forging Machine Twin Gear Drive, Belted Motor Drive, With A.C. Motor and Starter, Overhung Suspended Header & Die Slides

**FURNACE—MELTING**
15 to 25 ton Heroult Model V-12 Electric Melting Furnace, Top Charge hydraulically operated, Complete with Transformer Equipment

**GRINDER**
No. 72 Hanchett Vertical Surface Grinder Three Spindle 72" Rotary Table with Electrical Equipment

**LATHE—TURRET**
Gisholt Model 2L Turret Lathe, Motor Driven 15" Dia. 3 Jaw Universal Chuck, 4" Hole In Spindle. NEW 1942 or Later.

**PLANERS**
48 x 48" x 18' Cincinnati, Four Head
48 x 48" x 12' Niles-Bement-Pond, Four Head
60 x 60" x 12' Niles-Bement-Pond, Four Head
120 x 72" x 19' Betts, Four Head

**PLANER—OPEN SIDE**
60 x 60" x 18' Detrick & Harvey Three Head

**PRESS—HYDRAULIC FORGING**
1500 ton Mesta Steam Hydraulic Forging Press Quick Acting. 48" Stroke, 8' x 3'6" Between Columns — Including Wellman Manipulator. Rotating Type

**ROLLING MILL**
8 x 8" Standard Model 081 Two High, Complete Electrical Equip., Coiler, Uncoiler, Payoff and Takeup Reels
23" x 60" Mackintosh Hemphill Three High Breakdown Mill, Cast Steel Housings, Motor Driven Screw Downs, Complete with Pinion Stand, etc.

**SHEARS—BAR**
No. 14EF Pels, Belted Motor Drive. Capacity 1¼" Round, 1⅛" Sq. 3 x 3 x ½" Angles
No. O Hilles & Jones Guillotine Type. Capacity 1½" Round, 1⅛" Sq. 2½ x 2½ x ¼" Angles

**SHEAR—ROTARY**
#40A Quickwork, ½" Capacity. Circle Cutting Attachment & Elec. Equip. Included

**TESTING MACHINES**
10,000# Olsen Universal Wire Testing Machine
20,000# Southwark S10C Universal Hydr. Testing Machine
120,000 lb. SOUTHWARK-TATE-EMERY Universal Hydraulic Testing Machine. LATE
300,000 lb. SOUTHWARK-EMERY Universal Hydraulic Testing Machine

**WELDERS**
700 KVA Federal Flash Welder, Enclosed Rim Type, 440 Volt, Single Phase, Ring Sizes 6" to 35" Diameter x 12" Wide
40 KVA Sciaky Spot Welder, 36" Throat 440/3/60 operation

**RITTERBUSH & COMPANY INC.**
**50 Church Street, New York 8, N. Y.**
Phone—Cort 7-3437


# The Clearing House

**NEWS OF USED, REBUILT AND SURPLUS MACHINERY**

**Waiting for Defense**—The used machinery market in the Chicago area has lost a great deal of the spirit built up in the first 6 months of the year. Dealers have been opining on causes and two prominent ones are the business uncertainty because of Korea peace talks and the lack of sufficient subcontracts to small business.

The market is expected to level off at a fairly low pace for the rest of the year. What can turn the tide is a great influx of defense subcontracts, or government assurance that small firms will be able to get enough materials.

Some dealers have increased their use of promotion pieces and fliers to stir up the market a little bit. But customers stay in hiding and inquiries are not exactly bursting out all over.

**Rare Stuff Popular**—Demand for late type heavy production equipment remains potent. But this equipment is hard to track down. Users swarm to auctions and bid outlandish prices. Dealers are thus frozen out of what was a good source of equipment.

Some dealers in Chicago fear that opening of Air Force used machine tool warehouses at Marietta, Ohio, and Omaha to holders of contracts will take more buyers out of the market.

**On Lease Basis**—Air Force procurement officers have been visiting some dealers here to line up machines for small manufacturers. They want the machines on a lease basis—and this is probably to tide over firms until they can get new machine tools.

Dealers queried showed a reluctance to lease their equipment because they feel revenue from perhaps short-term leasing would not make the transaction worthwhile. And if the market does open up with a speed-up of the defense program, these leased machines may be frozen.

**Parts Situation**—Deliveries of replacement parts to Chicago seems to have improved although some forms still report holding up rebuilding because of the lack of special parts. Standard parts, however, are easier to get.

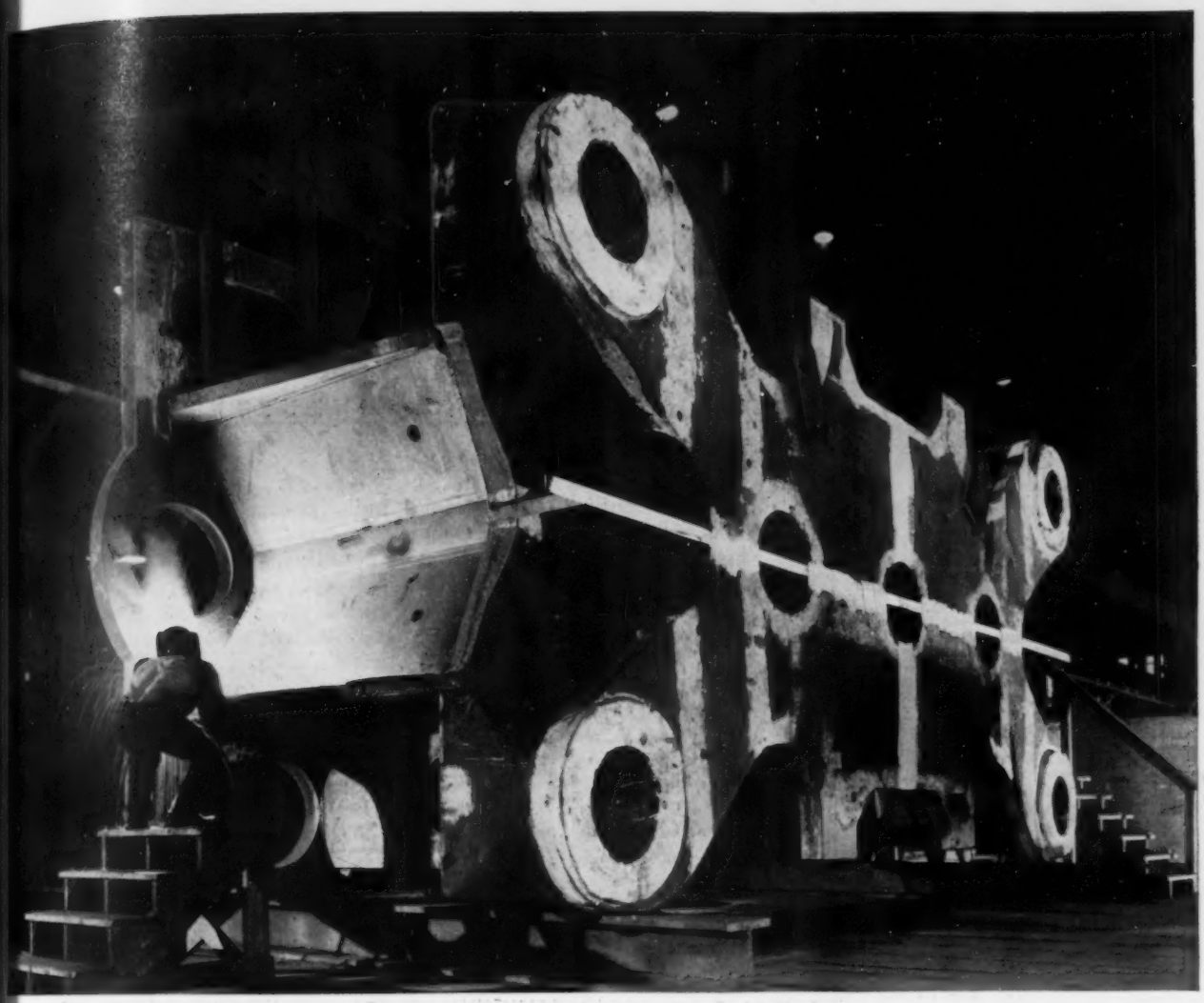
One rebuilder said he had to wait 6 months for a special bearing to complete rebuilding on one machine. Backlogs of builders now extend up to a year.

**Doesn't Mean You**—Office of Price Stabilization has amended its general manufacturers' order (CPR-22). Definition of a manufacturer does not now include a person who merely rebuilds, reconditions, renovates, renews, or otherwise restores a product or commodity. Neither CPR 22 nor CPR 30 (new machinery) applies to rebuilders, reconditioners.

**How Much Wire** — NISA has revised an estimate of how many pounds of magnet wire will be needed for a given volume of business. Still subject to individual fluctuations depending on sizes of jobs, the new figure now indicates that to produce $10,000 worth of repair billing, the average motor repair shop needs from 1200 to 1500 lb of magnet wire.

**Turn in Scrap**—Since ceiling prices have been established NISA stresses that there is now no advantage to come from holding back copper scrap. The shortage is continuing and the copper picture is not getting any better. Shops can improve the overall state of supply by installing a quick system of returning scrap.

NISA appends a plea for its members to hunt around for steel and iron scrap, saying that steel mills must be kept working at their top limit. It gave the example of Eastman Kodak Co., not a major scrap producer by any means. Nevertheless the company was made scrap conscious and uncovered three carloads.



# Crown for 8000-ton Hydraulic Press Made by Welding

Shown resting on its side, this Bethlehem Weldment is the crown for an 8000-ton triple-action hydraulic press for the aircraft industry. The crown consists of rolled steel plates and castings, approximately 6 in. thick, and welded together. It is 12 ft wide, 29 ft long, and 9 ft, 7 in., high. It weighs 168 tons.

Bethlehem Weldments are ideal for either large or small machinery parts because of their strength, durability, and economy. They can be produced as simple parts or intricate assemblies, in practically any size. They eliminate excess weight without sacrificing rigidity. They permit freedom of design, for the steel can be bent, pressed, or otherwise shaped prior to welding, without damage to the physical structure of the steel. They can also be used in combination with steel castings or forgings.

Before planning parts for new machinery, investigate the advantages of Bethlehem Weldments. Get in touch with the nearest Bethlehem sales office, stating the type of machine you have in mind.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

**BETHLEHEM WELDMENTS**